MI COVID RESPONSE DATA AND MODELING UPDATE

September 20, 2021

Executive Summary – All Indicators Show Increases

Michigan remains at <u>High Transmission</u>

Percent positivity (8.8%) is decreasing for one week (9.7% last week)

Case rate (234.4 cases/million) is increasing for 2.5 months (173.1 last week)

Michigan has 43rd lowest number of cases (41st last week), and 15th lowest case rate (15th last week) in the last 7 days

99% of positive tests available for sequencing in Michigan were **Delta variant** in the last 4 weeks

Percent of inpatient beds occupied by individuals with COVID (7.0%) is increasing for nine weeks (up from 6.8% last week)

Michigan has 12th lowest inpatient bed utilization (13th last week) and 13th lowest adult ICU bed utilization (13th last week)

Death rate (2.3 deaths/million) is increasing for seven weeks (1.8 last week). There were 157 COVID deaths between Sep 6-Sep 13

Michigan has the T26th lowest number of deaths (25th last week), and T7th lowest death rate (T8th last week) in the last 7 days

7-day average **state testing rate** increased to 3,674.4 tests/million/day. **Daily diagnostic tests (PCR)** is 35.0K per day, and the **weekly average for PCR and antigen tests** conducted in Michigan is 60.1K.

10.47 million **COVID-19 vaccine** doses administered, 51.8% of population is fully vaccinated (5.2 million people)

Science Round Up

Ridge regression model projects continued increases for cases and deaths in Michigan although case trends may be slowing

CDC models project plateau or decline in cases, plateau in hospitalizations, and slower increases for deaths

The proportion of kids getting sick with COVID-19 is increasing

In Michigan, over 50% of children hospitalized have no reported underlying conditions

Higher community transmission in Michigan is followed by higher incidence of MIS-C cases in Michigan

Case rates among children are higher in counties where school districts do not have mask policies

Global and National Comparisons: US cases increasing

Globally, 228,630,066 cases and 4,693,750 deaths (Data through 9/20/21)

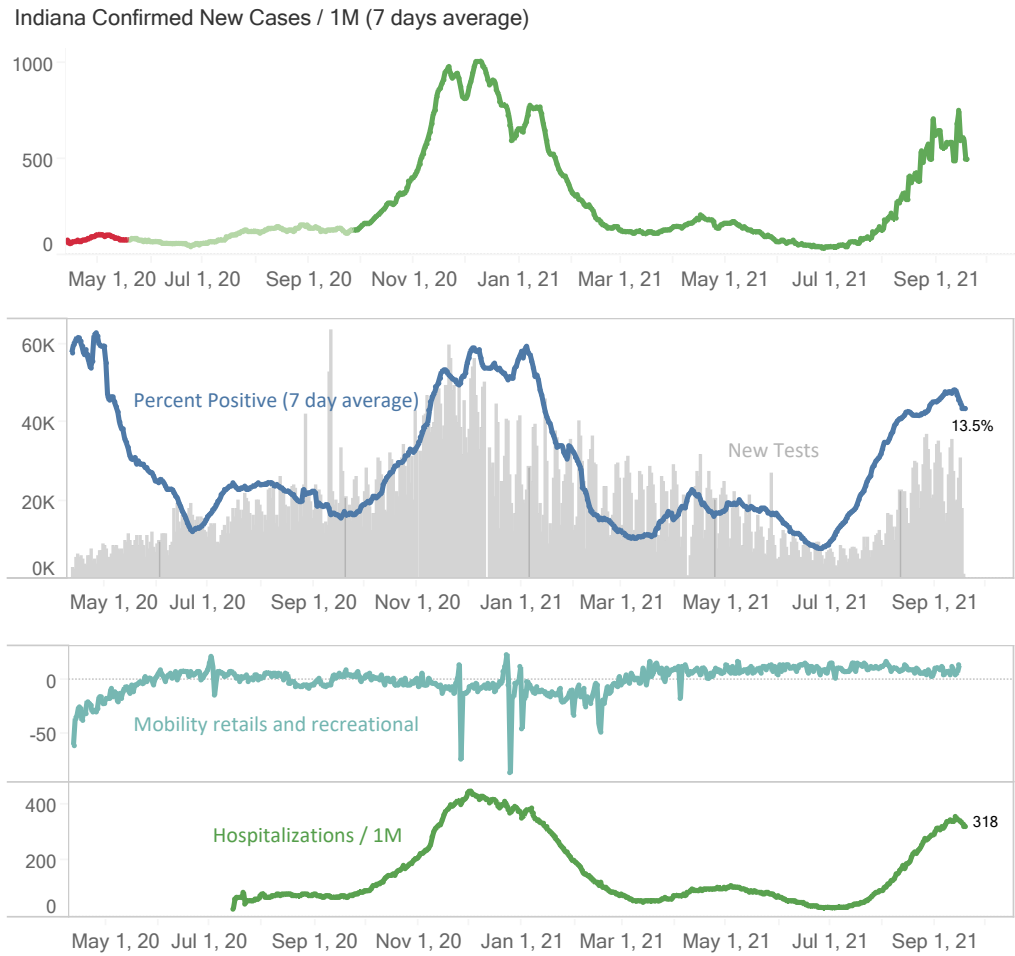
- Countries with the highest case count are U.S. (42,088,404), India (33,478,419), and Brazil (21,239,783)

United States: Nearly all US jurisdictions have high community transmission

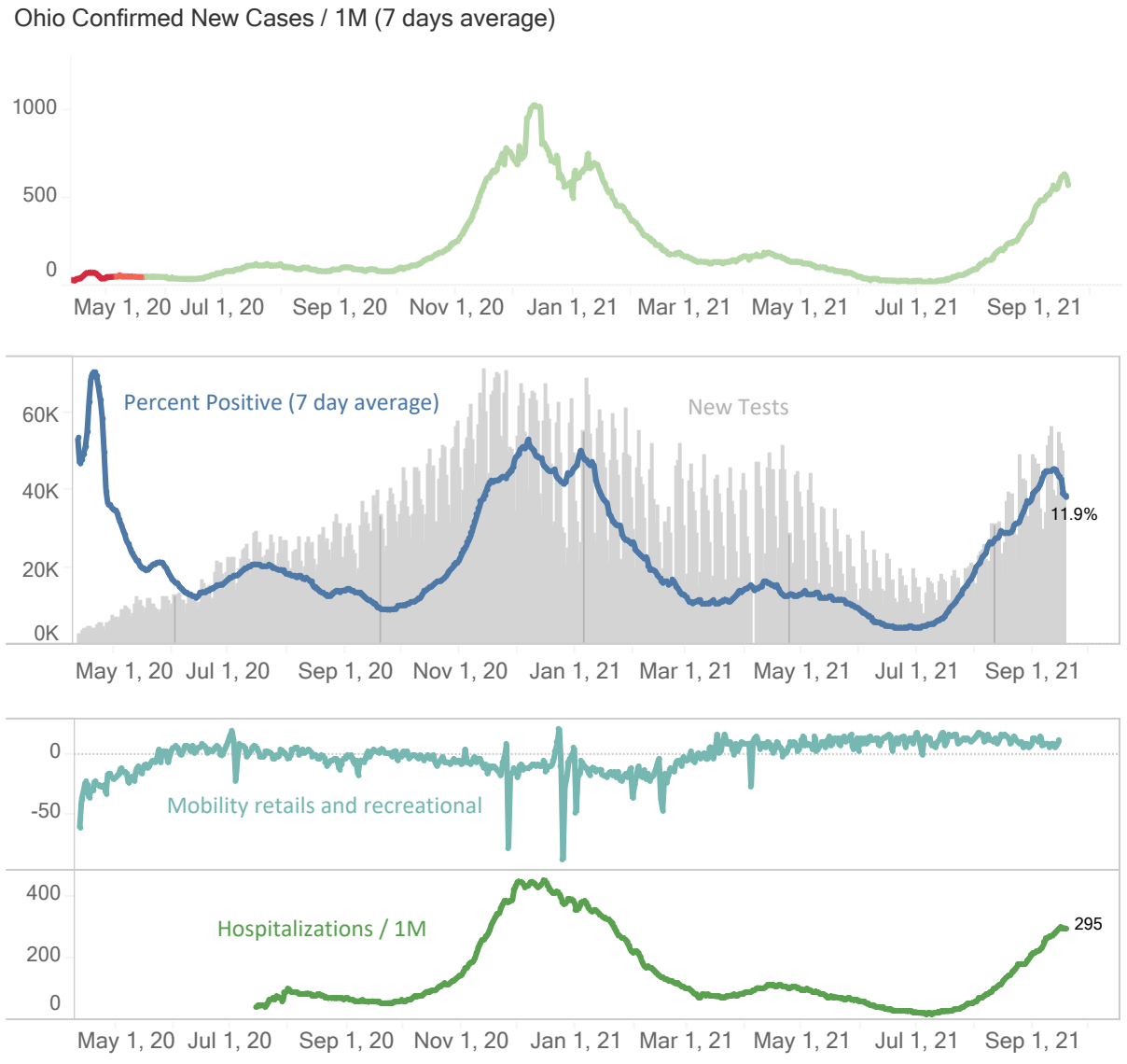
- California and Puerto Rico now Substantial
- Rates highest in non-metropolitan counties
- 7-day moving average of daily new cases increased 6.1% compared with previous 7-day moving average
- Percent positivity has decreased from the previous week, now at 8.9%. The number of PCR tests performed has also declined.

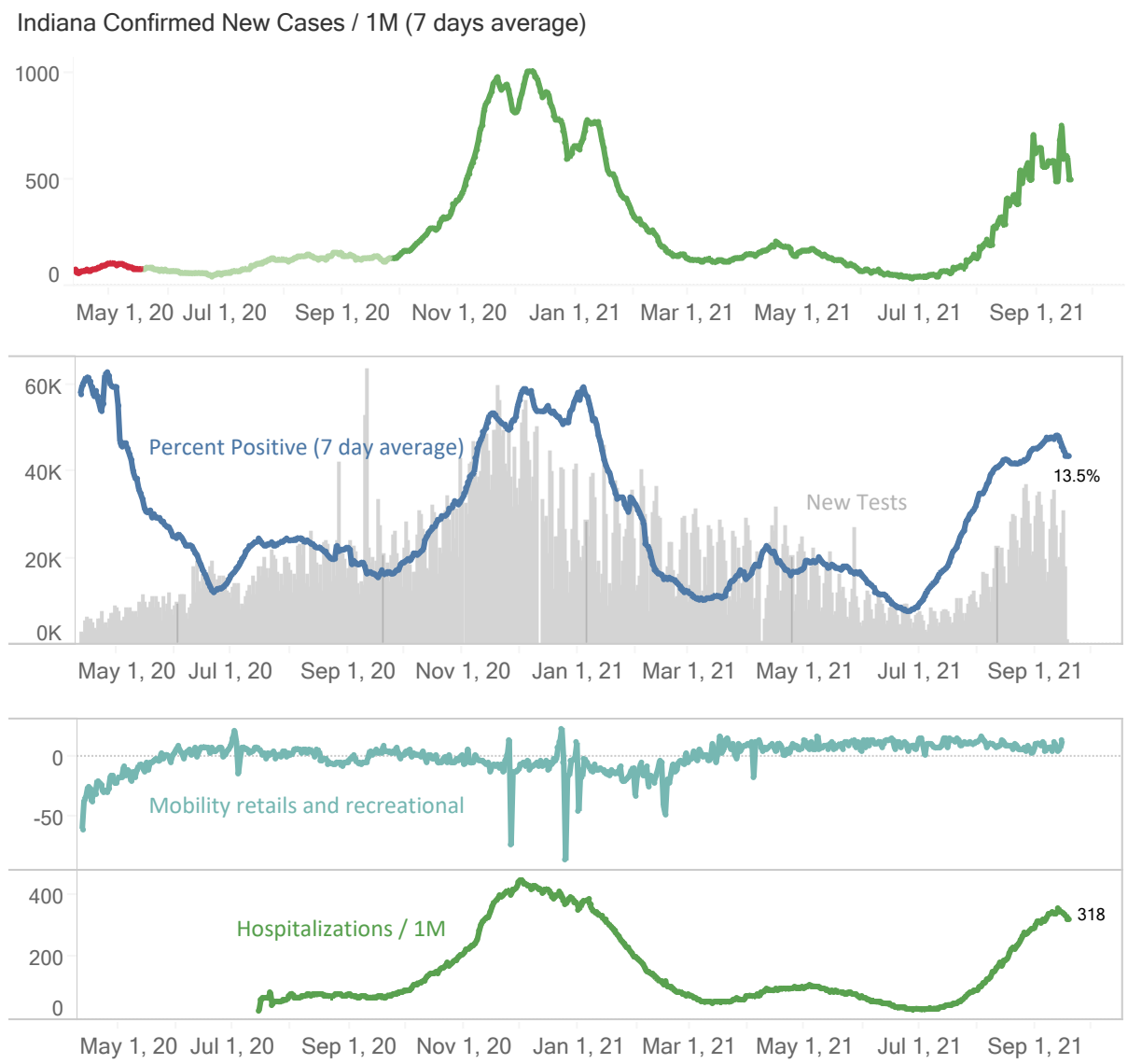
Midwest states maintain high transmission levels

- Some indication of slowing (Indiana example)

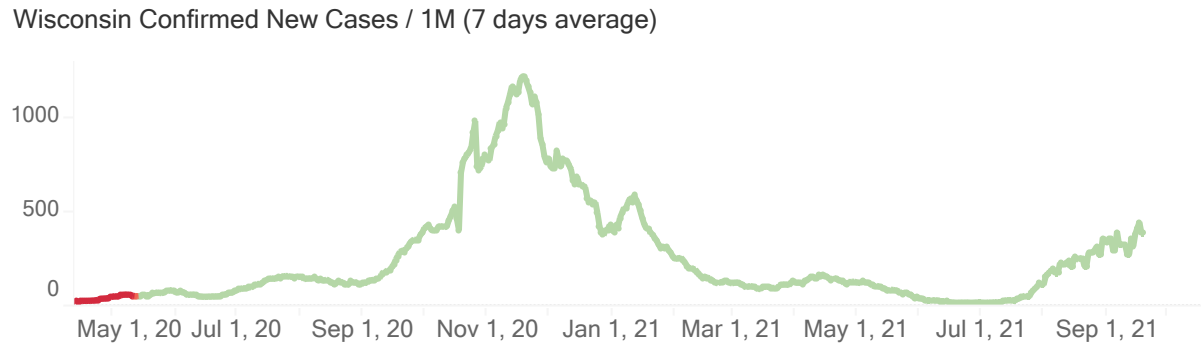


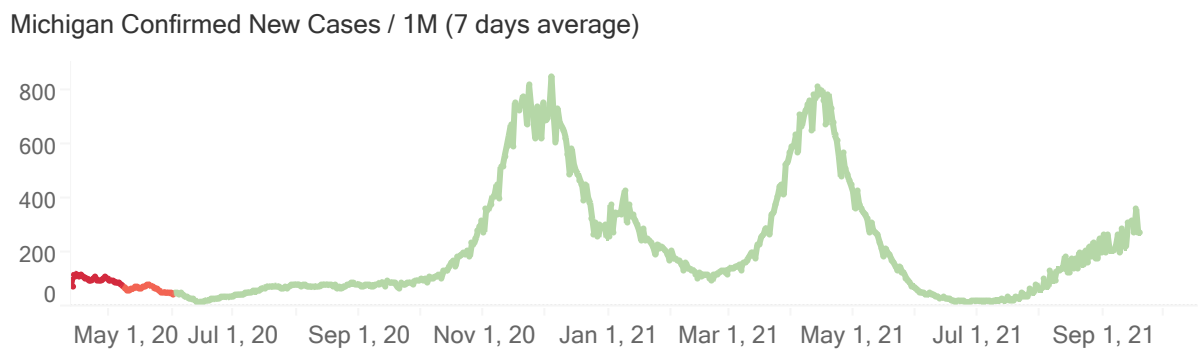
State Comparisons: Ohio and Indiana

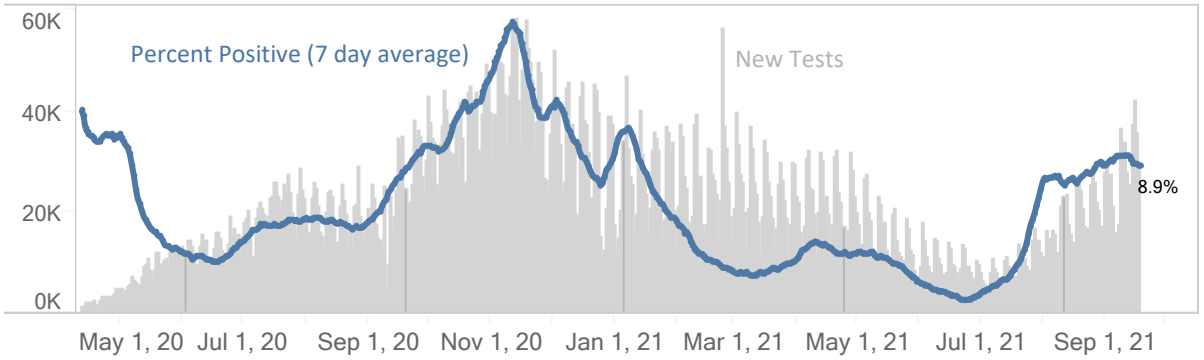


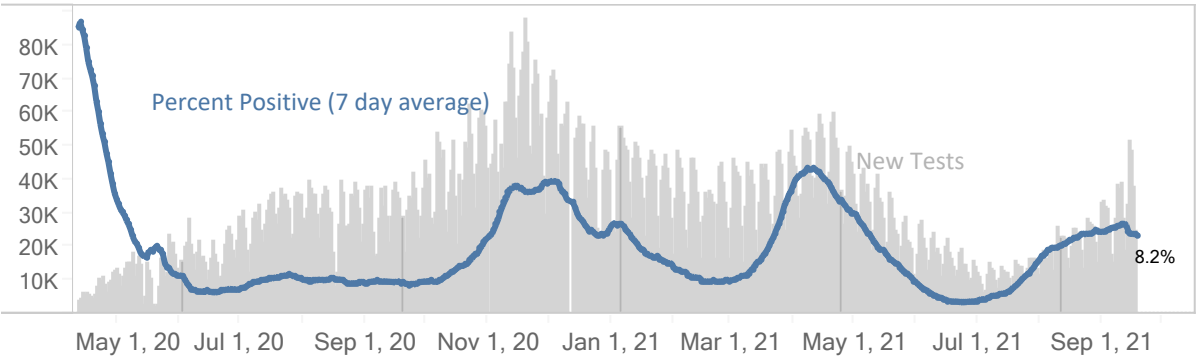


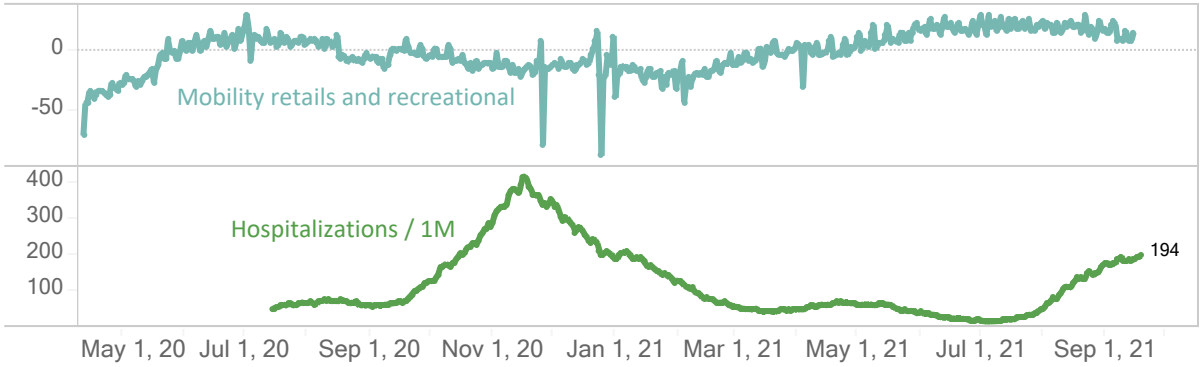
State Comparisons: Wisconsin and Michigan

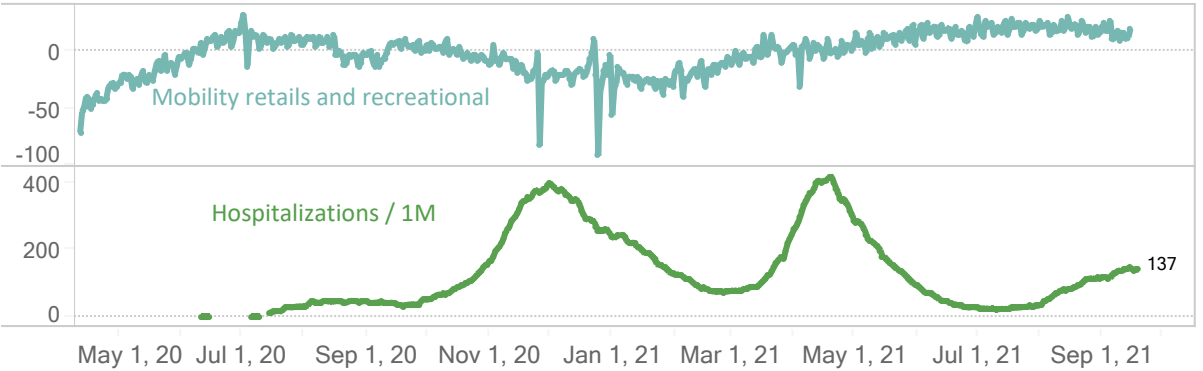












Key Messages: COVID-19 is Spreading Faster Among Younger Ages

Statewide positivity has decreased to 8.8% (last week: 9.7%)

- First one week decrease since June 26
- Positivity is decreasing in half of the MERC regions
- Positivity in six regions is above 10%

Case rate has increased to 234.4 cases/million (last week: 173.1 cases/million)

- Increasing for two and half months (June 26 low)
- Cases per million are increasing in most MERC regions
- 10 to 19-years-olds are experiencing the greatest case burden (485.3 daily cases; 386.7 cases/million) and the largest case growth (+27%)
- Each day more than 315 children under age 12 become infected with COVID-19, 80 more children per day than last week
- 50 children under the age of 18 are admitted to the hospital each day

Michigan is at High Transmission level

- More than 98% of the counties in Michigan are at high transmission level
- CDC recommends all individuals, regardless of vaccination status, should mask indoors
- The U.S. is at high transmission level (250.7 cases/100,000 in last 7 days) with 54 states/territories in substantial or high transmission

Number of active outbreaks is up 30% from last week

- 175 new outbreaks were identified in the past week
- K-12 reported the most total outbreaks (218) and new outbreaks (98) this week

Confirmed and probable case indicators

Table Date: 9/20/2021 (7 days from date table was produced: 9/13/2021)

Risk levels: Low A B C D E

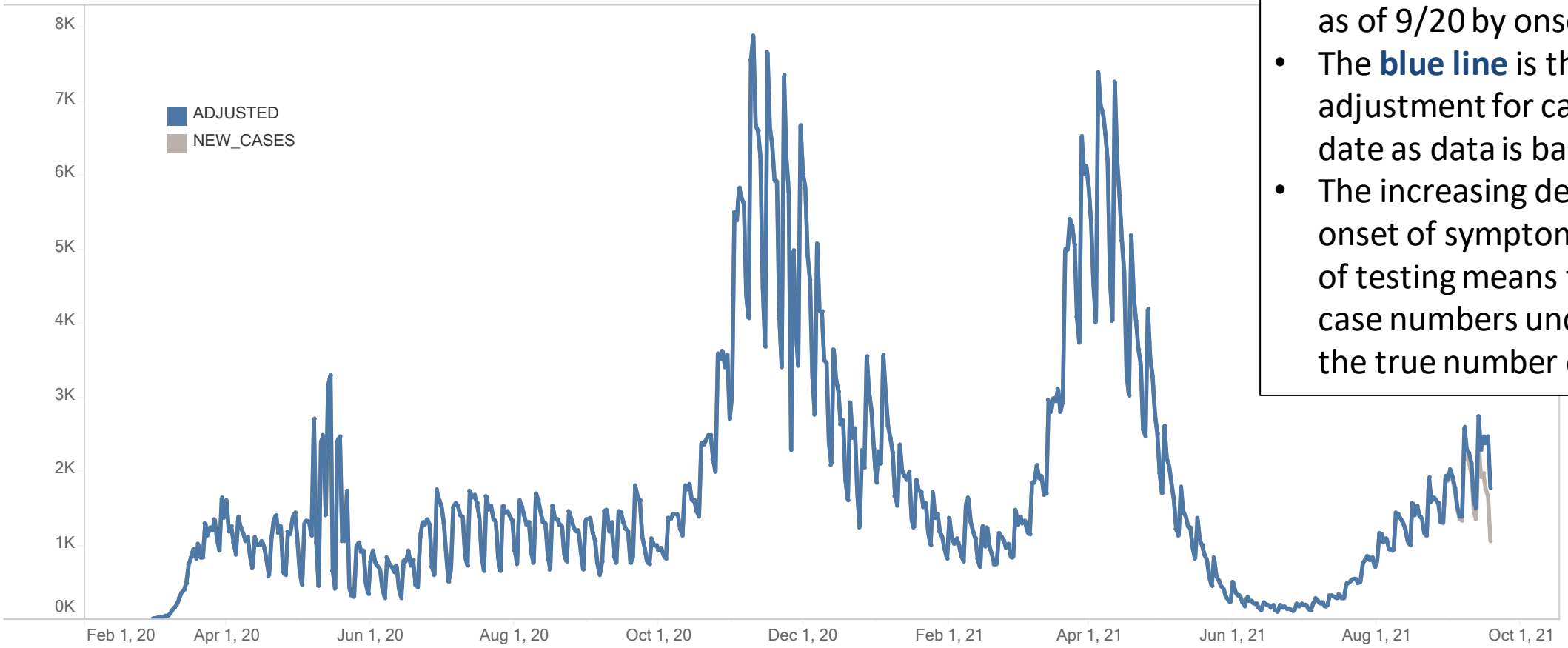
	CDC Transmission Risk Level	Absolute Cases (per million)	CDC Case Trend	Average Percent Positivity	Positivity Trend	Tests (per million)	% IP Beds Occupied by COVID-19 Cases	% Occupied IP Beds Trend	Absolute Deaths (per million)	Death Trend
Detroit	High	179.8	decline [7 days]	6.4	Decrease - 1wk	3663.3	6.0	Increase - 1wk	1.8	Increase - 7wk
Grand Rapids	High	303.6	elevated incidence growth	11.9	Decrease - 1wk	3803.5	9.6	Increase - 9wk	2.5	Increase - 1wk
Kalamazoo	High	298.6	elevated incidence growth	10.5	Decrease - 3wk	4008.9	8.9	Decrease - 2wk	2.7	<20 wkly deaths
Saginaw	High	306.5	elevated incidence growth	12.1	Increase - 1wk	3153.0	6.0	Increase - 8wk	3.3	<20 wkly deaths
Lansing	High	234.2	elevated incidence growth	9.4	Increase - 1wk	3031.8	10.0	Decrease - 1wk	2.7	<20 wkly deaths
Traverse City	High	257.8	elevated incidence growth	10.4	Increase - 2wk	2600.4	6.5	Increase - 8wk	2.3	<20 wkly deaths
Jackson	High	316.6	elevated incidence plateau	11.9	Decrease - 1wk	3358.7	15.0	Increase - 3wk	3.3	<20 wkly deaths
Upper Peninsula	High	370.5	elevated incidence growth	11.7	Increase - 8wk	3369.7	5.9	Increase - 1wk	3.3	<20 wkly deaths
Michigan	High	234.4	elevated incidence plateau	8.8	Decrease - 1wk	3674.4	7.0	Increase - 9wk	2.3	Increase - 7wk

Cases Low: <7 | A: 7-20 | B: 20-40 | C: 40-70 | D: 70-150 | E: >=150

Positivity Low: <3% | A: 3-7% | B: 7-10% | C: 10-15% | D: 15-20% | E: >=20%

Michigan Lag adjusted new COVID cases by onset date

New confirmed cases by onset actual and adjusted as of September 20, 2021 (-2 days)



- The **gray line** is cases reported as of 9/20 by onset date.
- The **blue line** is the expected adjustment for cases by onset date as data is backfilled
- The increasing delay between onset of symptoms and date of testing means that recent case numbers underestimate the true number of cases

Overview of metrics for individuals < 18

Region	Population (<12 yrs)	Population (<18 yrs)	Cumulative Case Count (<12 yrs)	7-day Average Daily Case Count (<12 yrs)	7-day Average Daily Case Rate per Million (<12 yrs)	7-day Average Daily Pediatric Hospitalization Count (<18 yrs)	7-day Average Daily Pediatric Hospitalization Rate per Million (<18 yrs)	7-day Average Daily Death Count (<12 yrs)
Detroit	735529	1134247	33953	126.0	171.3	30.9	27.2	0.0
Grand Rapids	230120	350652	11886	66.1	287.2	7.1	20.2	0.0
Kalamazoo	140422	214801	6496	36.9	262.8	5.0	23.3	0.1
Saginaw	78759	122834	3881	25.3	321.2	1.0	8.1	0.1
Lansing	78140	119915	3835	15.6	199.6	5.0	41.7	0.0
Traverse City	53099	83462	1897	15.7	295.7	0.3	3.6	0.0
Jackson	41274	64091	1860	11.4	276.2	0.1	1.6	0.0
Upper Peninsula	34645	53875	1856	18.9	545.5	0.6	11.1	0.0
Michigan	1391988	2143877	65752	316.6	227.4	50.0	23.3	0.3

Each day more than 315 children under age 12 become infected with COVID-19, 80 more children per day than last week

Pediatric case rates have increased from 168.2 to 227.4 with all regions

The Traverse City Region has more than tripled, going from 86.6 to 295.7 cases per million children since last week

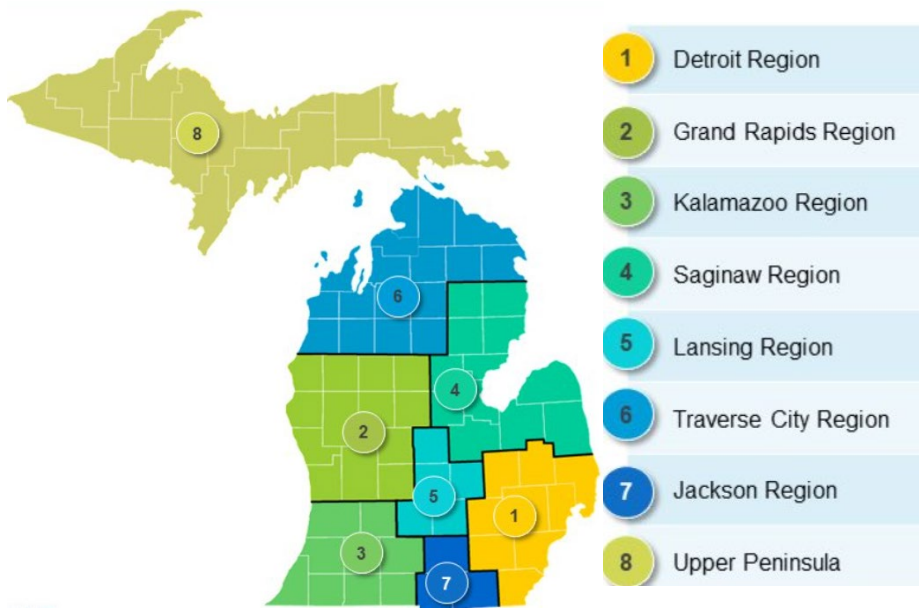
50 children (<18) are admitted to the hospital each day.

Note: Data as of 9/20; case data 9/13, hospitalization data 9/20. Hospitalization data is for pediatric patients (<18)

Overview of metrics for individuals < 18: Key changes from last week

Region	Pediatric Case Rate – One Week % Change (Δ Rate)	Pediatric Hospitalization Rate – One Week % Change (Δ Rate)
Detroit	21% (+30.0)	8% (+1.9)
Grand Rapids	50% (+95.6)	-10% (-2.3)
Kalamazoo	48% (+85.5)	1126% (+21.4)
Saginaw	85% (+147.3)	42% (+2.4)
Lansing	-5% (-10.3)	28% (+9.2)
Traverse City	241% (+209.1)	ND* (+3.6)
Jackson	7% (+17.0)	0% (+0)
Upper Peninsula	39% (+152.9)	ND* (+11.1)
Michigan¶	**35% (+59.2)**	**20% (+3.8)**

* Not divisible with 0 denominator ¶ Total may not reflect state due to missing age data
Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: Case data - Michigan Disease Surveillance System (MDHHS), Hospitalization data - EM Resource



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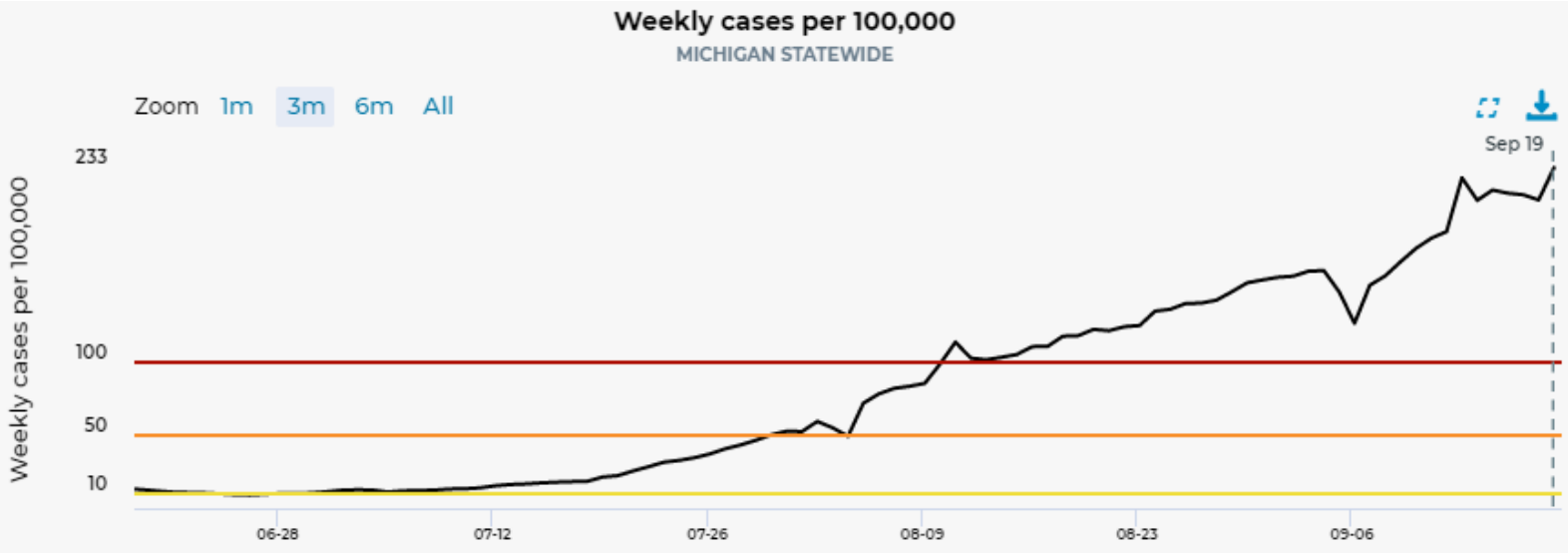
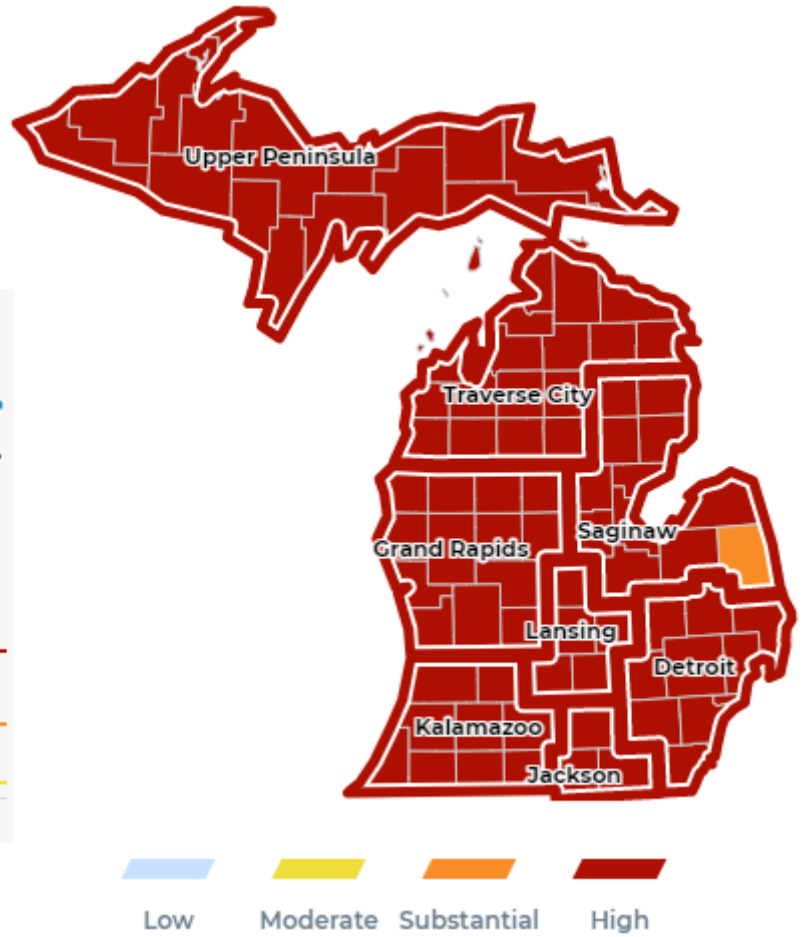
Michigan at High Transmission Level and continuing to increase

Dashboard | CDC | MI Start Map for most recent data by reporting date

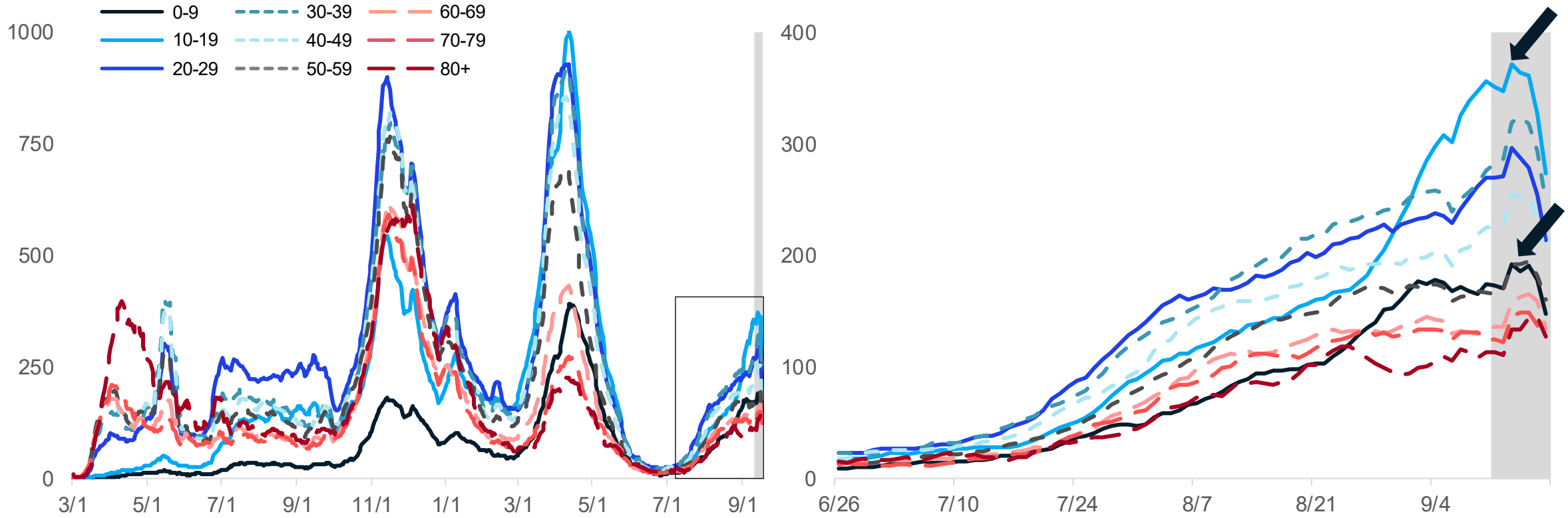




Source: MI Start Map; data through 9/13/2021

Case Rate Trends are Increasing for All Age Groups

Daily new confirmed and probable cases per million by age group (7-day rolling average)



- Case rate trends for all age groups are increasing
- Case rates for all age groups are between 120 and 390 cases per million (through 9/3)
- Case rates are highest for 10-19-year-olds followed by 30-39, 20-29, 40-49, and 0-9

Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

Number of Cases and CaseRates are Increasing for Most Age Groups

Daily new confirmed and probable cases per million by age group (7-day rolling average)

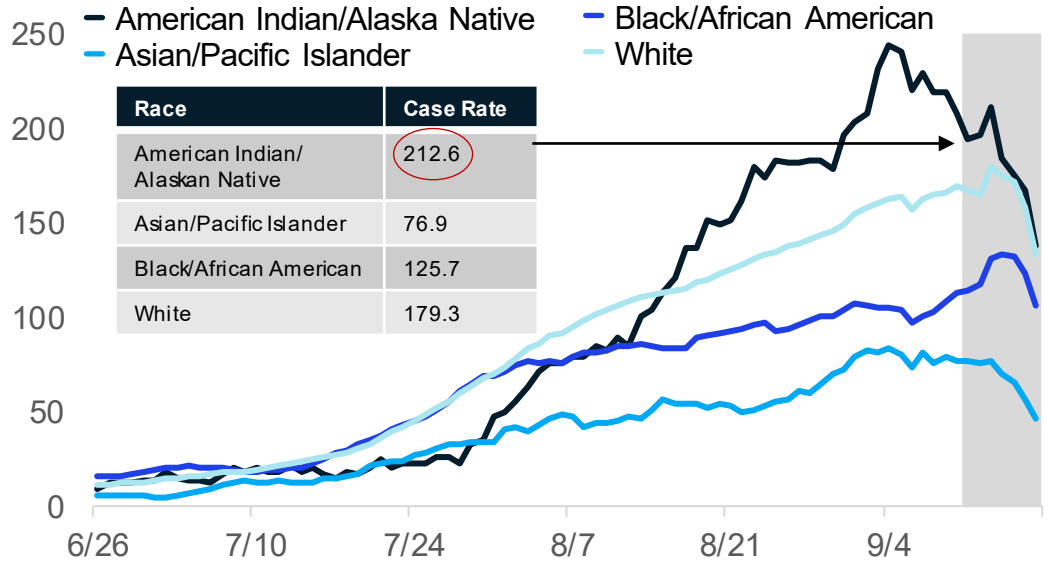
Age Group	Average† daily cases	Average† Daily Case Rate	One Week % Change (Δ #)
0-9	229.6	199.1	18% (+35)
10-19	**485.3**	**386.7**	**27% (+102)**
20-29	383.6	**278.0**	22% (+69)
30-39	364.9	**300.8**	26% (+75)
40-49	279.9	**237.3**	23% (+53)
50-59	245.4	181.8	13% (+29)
60-69	192.7	151.1	15% (+26)
70-79	103.1	134.5	6% (+6)
80+	50.0	120.7	13% (+6)
Total¶	**2,348.6**	**234.4**	**21% (+401)**

† Rolling 7-day average; ¶ Total may not reflect state due to missing age data
Note: Case information sourced from MDHHS and reflects date of onset of symptoms
Source: MDHHS – Michigan Disease Surveillance System

- Largest one-week growth among those 10 to 19 years of age (27%, +102 cases/day)
- Average daily number of cases (485.3) and avg. daily case rate (386.7 case/mil) are highest for those aged 10-19
- Case rate trends are increasing for all age groups
- Case rates for age groups 10-19, 20-29, 30-39, and 40-49 are all higher than the state
- Case rates bottomed out on June 26, 2021

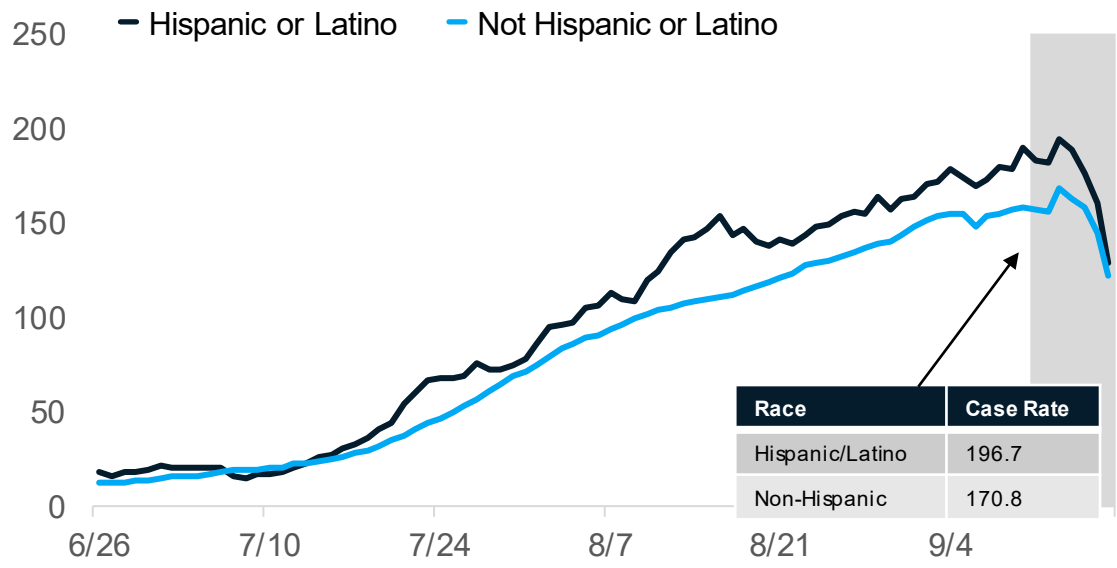
Case Rates for All Reported Racial and Ethnic Groups are Increasing

Daily new confirmed and probable cases per million (7 day rolling average) by race category



Race	Case Rate
American Indian/ Alaskan Native	212.6
Asian/Pacific Islander	76.9
Black/African American	125.7
White	179.3

Daily new confirmed and probable cases per million (7 day rolling average) by ethnicity category



Race	Case Rate
Hispanic/Latino	196.7
Non-Hispanic	170.8

Updates since last week:

- Cases per million are increasing for all races and ethnicities
- The high number of cases with missing race/ethnicity data, and those multiracial or other are impacting the case rates shown here
- **American Indian/Alaskan Native have the highest case rates**
- In the past 30 days, 21% (↓1%) of race data and 26% (↓1%) ethnicity data was either missing or reported as unknown

Note: Case information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System

Identified COVID-19 Cases Caused by All Variants of Concern (VOC) in US and Michigan

Variants Circulating in United States, Sep 5 – Sep 11 (NOWCAST)

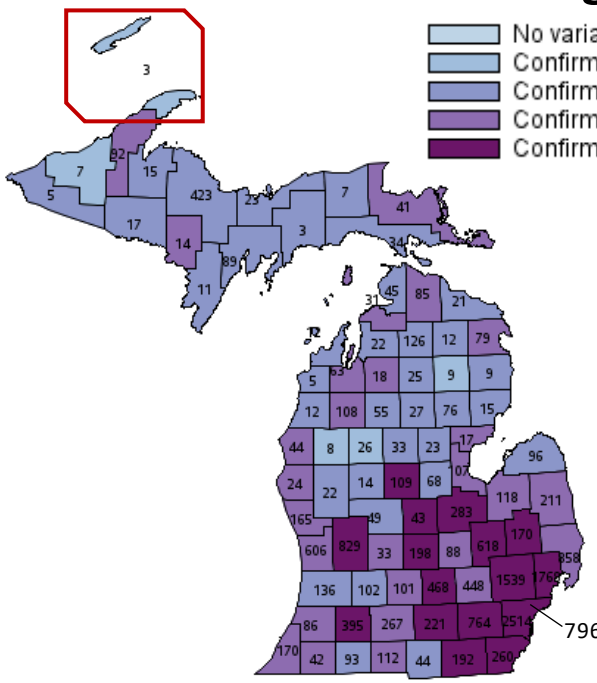
USA

WHO label	Lineage #	Type	%Total	95%PI
Alpha	B.1.1.7	VOC	0.0%	0.0-0.2%
Beta	B.1.351	VOC	0.0%	0.0-0.2%
Gamma	P.1	VOC	0.0%	0.0-0.2%
Delta	B.1.617.2	VOC	99.4%	98.6-100.0%
	AY.1	VOC	0.2%	0.0-0.7%
	AY.2	VOC	0.1%	0.0-0.5%
Eta	B.1.525	VOI	0.0%	0.0-0.2%
Iota	B.1.526	VOI	0.0%	0.0-0.2%
Kappa	B.1.617.1	VOI	0.0%	0.0-0.2%
Mu	B.1.621		0.1%	0.0-0.5%
N/A	B.1.617.3	VOI	0.0%	0.0-0.2%
Other	Other*		0.2%	0.0-0.7%

* Enumerated lineages are VOI/VOC or are circulating >1% in at least one HHS region during at least one two week period; remaining lineages are aggregated as "Other".
** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates
# Sublineages of P.1, B.1.351 and B.1.621 are aggregated with the parent lineage and included in parent lineage's proportion. Q.1-Q.8 are aggregated with B.1.1.7. AY.3-AY.25 are aggregated with B.1.617.2.

Data last updated Sep 20, 2021
Source: https://covid.cdc.gov/covid-data-tracker/#variant-proportions and MDSS

Variants of Concern in Michigan, Sep 20



For the first time last week, all 83 counties have had a least one specimen sequenced with a variant.

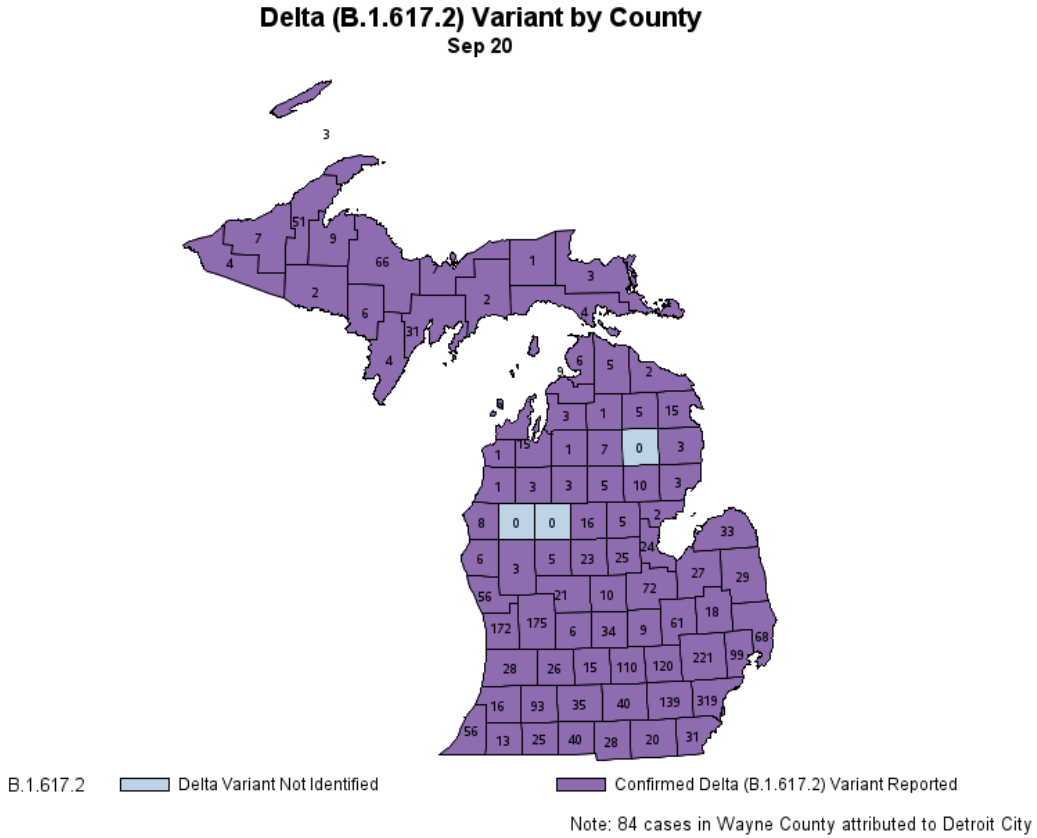
Keweenaw now has 3 Delta specimen sequence results reported in the last week

Variant	MI Reported Cases¶	# of Counties	% Specimens in last 4 wks
B.1.1.7 (alpha)	13,698*	81	0%
B.1.351 (beta)	88	24	0%
P.1 (gamma)	336	35	0.2%
B.1.617.2 (delta)	**2,785 (↑658)**	**80 (↑3)**	**99.8%**

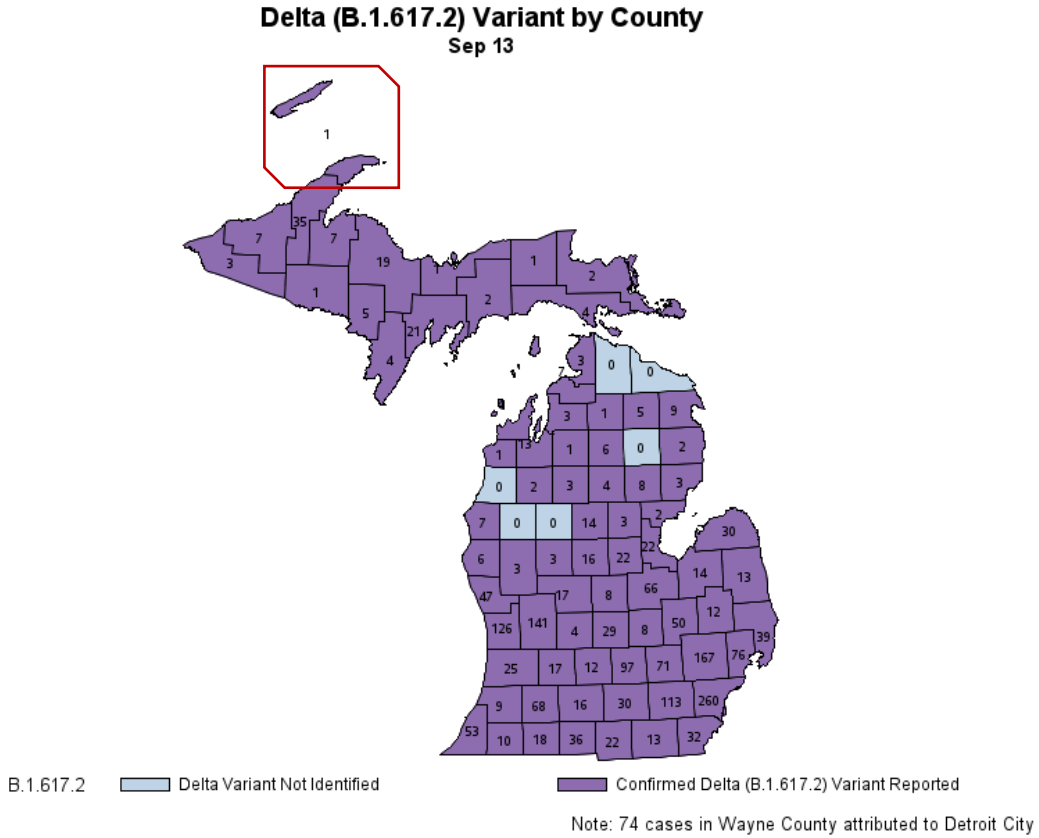
* 534 cases within MDOC; ¶ 44 cases with county not yet determined

Identified COVID-19 Delta Variants by County

This week (Sep 20, 2021)



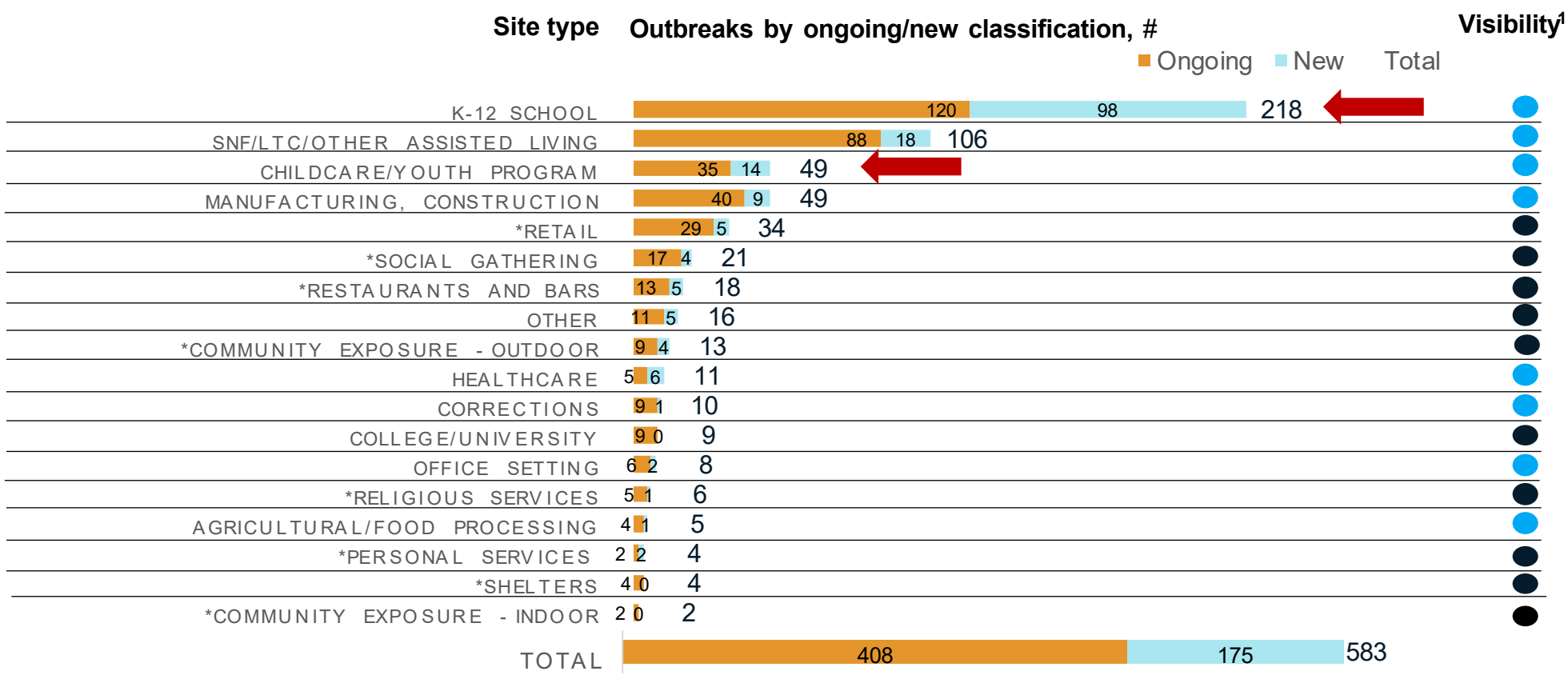
Last week (Sep 13, 2021)



Data last updated Sep 20, 2021
Source: MDSS

Number of Outbreaks Reported has Increased

Number of outbreak investigations by site type, week ending Sep 16



1. Based on a setting's level of control and the extent of time patrons/residents spend in the particular setting, different settings have differing levels of ability to ascertain whether a case derived from that setting

NOTE: Many factors, including the lack of ability to conduct effective contact tracing in certain settings, may result in significant underreporting of outbreaks. This chart does not provide a complete picture of outbreaks in Michigan and the absence of identified outbreaks in a particular setting in no way provides evidence that, in fact, that setting is not having outbreaks.

Source: LHD Weekly Sitreps

Total number of active outbreaks is **up 30%** from previous week, with 175 new outbreaks identified (39 more than last week)

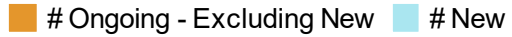
K-12 schools reported the greatest number of new outbreaks (98) this week, and there were an additional 14 new outbreaks in childcare and youth programs for a total of 112 outbreaks in settings primarily with 0-19-year-olds. (64% of all known new outbreaks)

The next greatest number of new outbreaks was among SNF/LTC (18), followed by manufacturing/construction (9), healthcare (6), and ten other settings with at least 1 new outbreak in the last week.

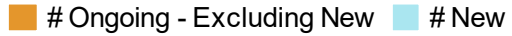
K-12 school outbreaks, recent and ongoing, week ending Sep 16

Number of reported outbreaks increased since last week (108 to 218), including increases in High Schools (44 to 88), Middle/Jr High (17 to 46), Pre K-Elementary (39 to 79), and Administrative (4 to 5).

Region	Number of reported cases, #	Number of outbreaks	Range of cases per outbreak
Region 1	198 / 61	53	2-18
Region 2n	23 / 27	17	2-8
Region 2s	52 / 48	22	2-14
Region 3	255 / 80	51	2-42
Region 5	66 / 48	24	2-31
Region 6	123 / 80	30	2-44
Region 7	0 / 17	3	4-9
Region 8	59 / 51	18	2-20
Total	776 / 412	**218**	**2-44**



Grade level	Number of reported cases, #	Number of outbreaks	Range of cases per outbreak
Pre-school - elem.	203 / 150	79	2-31
Jr. high/middle school	143 / 95	46	2-13
High school	416 / 167	88	2-44
Administrative	14 / 0	5	2-6
Total	776 / 412	**218**	**2-44**



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Key Messages: Healthcare Capacity and COVID Severity

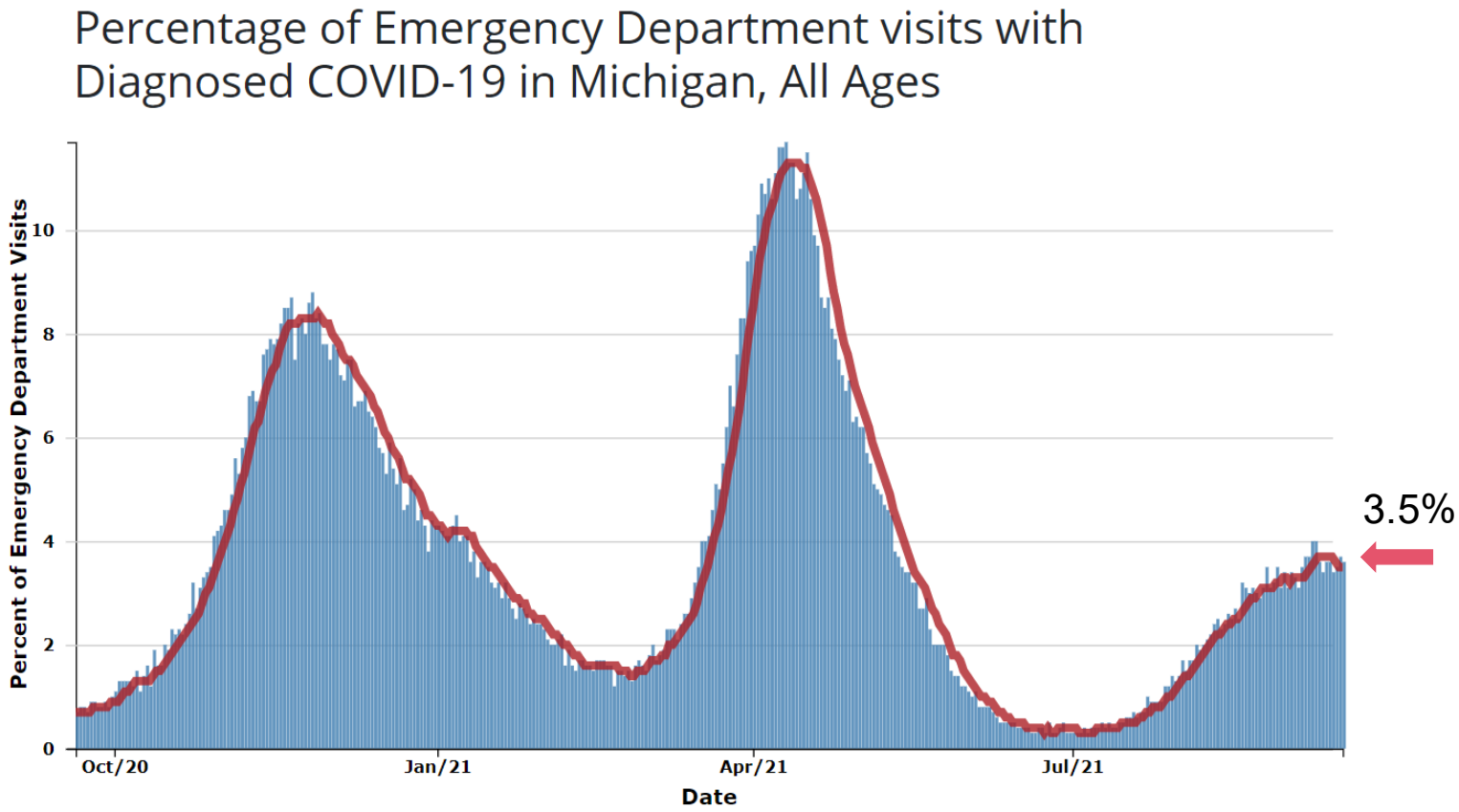
Hospitalizations and ICU utilization are either steady or increasing

- 3.5% of ED visits are for COVID diagnosis (steady from 3.5% last week)
- Hospital admissions are increasing for most age groups this week
- Hospitalizations are steady since last week (vs. 18% increase week prior)
- Nearly half of regions experienced **decreasing** hospitalization trends this week
  - Hospitalization for COVID-19 is highest in Regions 2N, 3, and 6
  - Most growth is in Regions 3, 7, and 8
- Volume of COVID-19 patients in intensive care has **decreased** 3% since last week (vs. 16% increase last week)

Death rate has increased to 2.3 daily deaths/million residents (up from 1.8 deaths/million last week)

- One week percent change is up 9% (vs. up 7% last week)
- Death rate has increased seven weeks (423% increase since Jul 22 low)
- 30-day proportion of deaths among those under 60 years of age is steady from the prior week

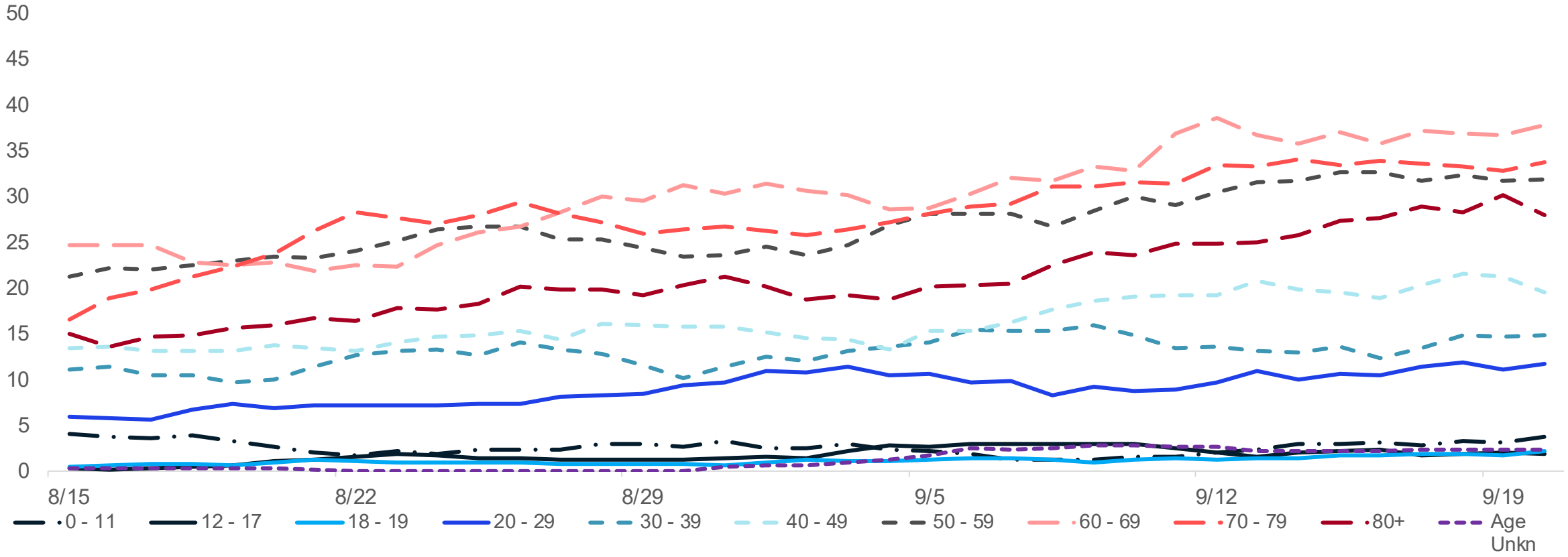
Michigan Trends in Emergency Department (ED) Visits for Diagnosed COVID-19



- Trends for ED visits have remained steady at 3.5% since last week (3.5% week prior)
- Trends vary by age groups with all age groups seeing an increase
- Over past week, those 50-64 years saw highest number of avg. daily ED CLI visits (4.7%), but those between 25 and 74 all above state average

Source: https://covid.cdc.gov/covid-data-tracker/#ed-visits

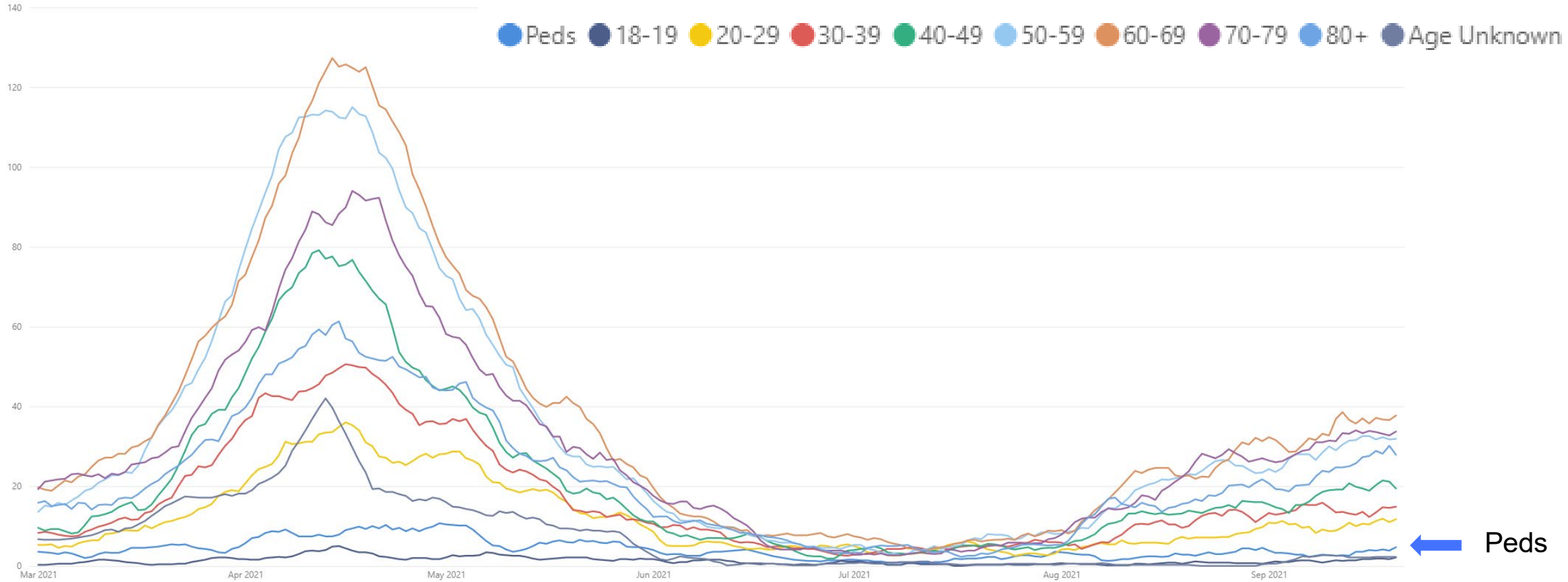
Average Hospital Admissions Are Increase for all Age Groups



- Trends for daily average hospital admissions have increased 5% since last week (vs. 13% increase prior week)
- Most age groups experienced a one week increase in daily hospital admissions
- Over the past week, those 60-69 years have seen the highest number of avg. daily hospital admissions (38 admissions)

Source: CHECC & EM Resource

Average Hospital Admissions Are Increase for all Age Groups



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Source: CHECC & EM Resource

Number of Hospital Admissions and Admission Rates are Increasing for Most Age Groups but Slower than Last Week

Daily new hospital admission per million by age group (7 -day rolling average)

Age Group	Average† daily hos	Average† Daily Case Rate*	One Week % Change (Δ#)
0-11	3.7	2.7	**63% (+1)**
12-17	1.9	2.5	18% (+<1)
18-19	2.1	8.1	50% (+1)
20-29	11.7	8.5	8% (+1)
30-39	14.9	12.2	13% (+2)
40-49	19.4	16.5	-6% (-1)
50-59	31.9	**23.6**	1% (+<1)
60-69	**37.7**	**29.6**	3% (+1)
70-79	33.7	**44.0**	2% (+1)
80+	27.9	**67.3**	11% (+3)
Total¶	**187.1**	**18.7**	**5% (+9)**

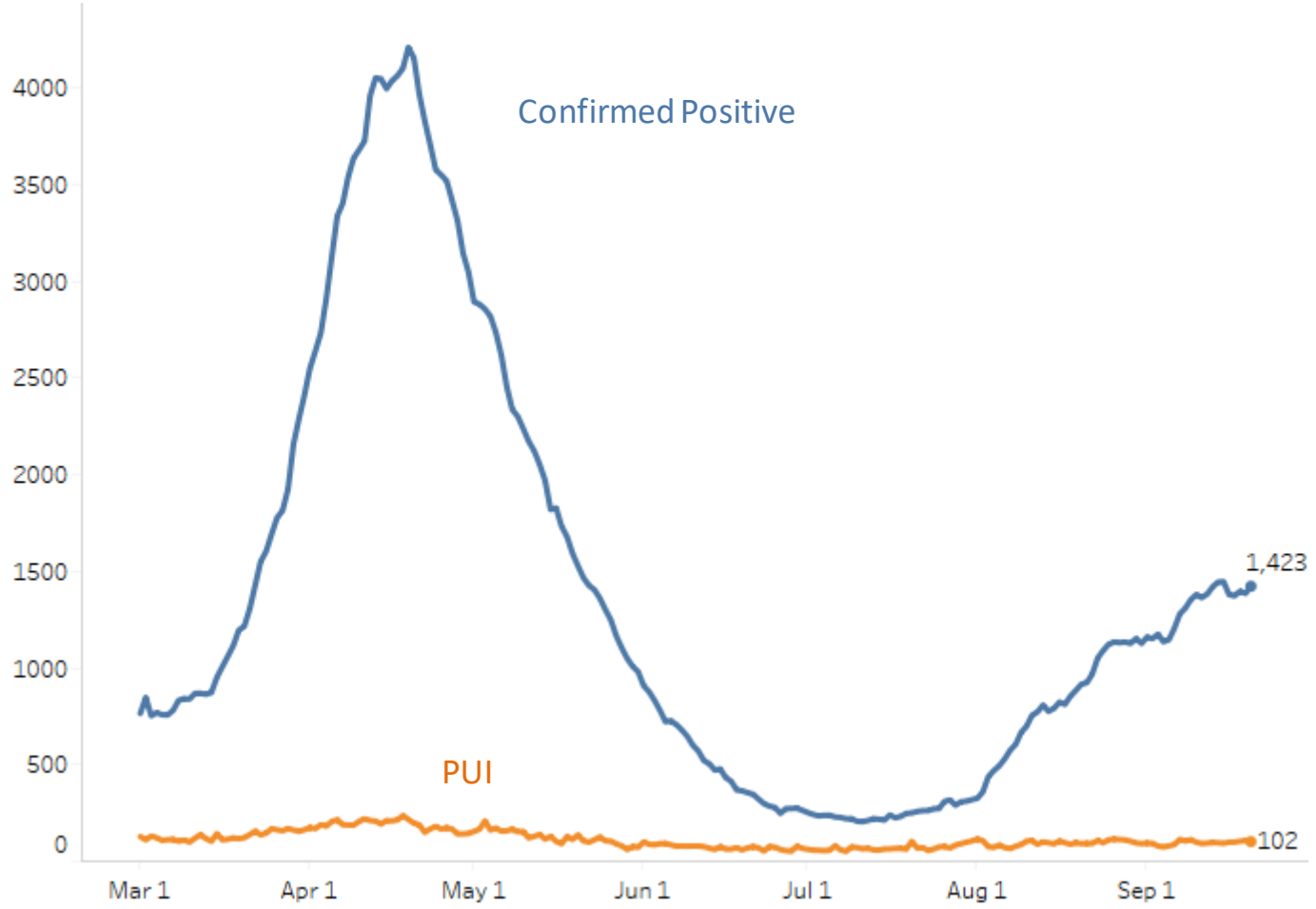
* Rate per 1 million residents; † Rolling 7-day average; ¶ Total may not reflect state due to missing age data
Note: Hospital Admission data reflects date data was submitted
Source: CHECC and EM Resource

- Through September 20, there were an average of 187 hospital admissions per day due to COVID-19, which is 9 (5%) more than last week
- The largest one-week percent change in admissions was among those 0-11 years of age (63%) and this accounts for ~1 additional COVID hospital admission per day
- Average number of daily hospital admissions (37.7) are highest for those aged 60-69
- Average daily hospital admission rate (67.3 hospital admissions/million) are highest for those aged 80+

Note: for some age groups, small changes in number of hospitalization admissions can cause large change in One Week Percent Change

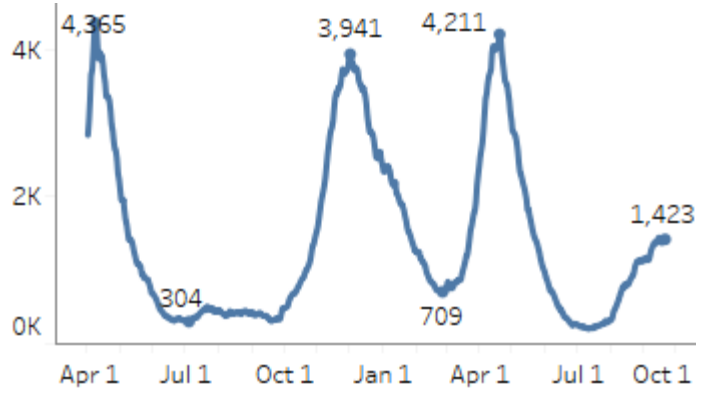
Statewide Hospitalization Trends: Total COVID+ Census

Hospitalization Trends 3/1/2021 – 9/20/2021
Confirmed Positive & Persons Under Investigation (PUI)



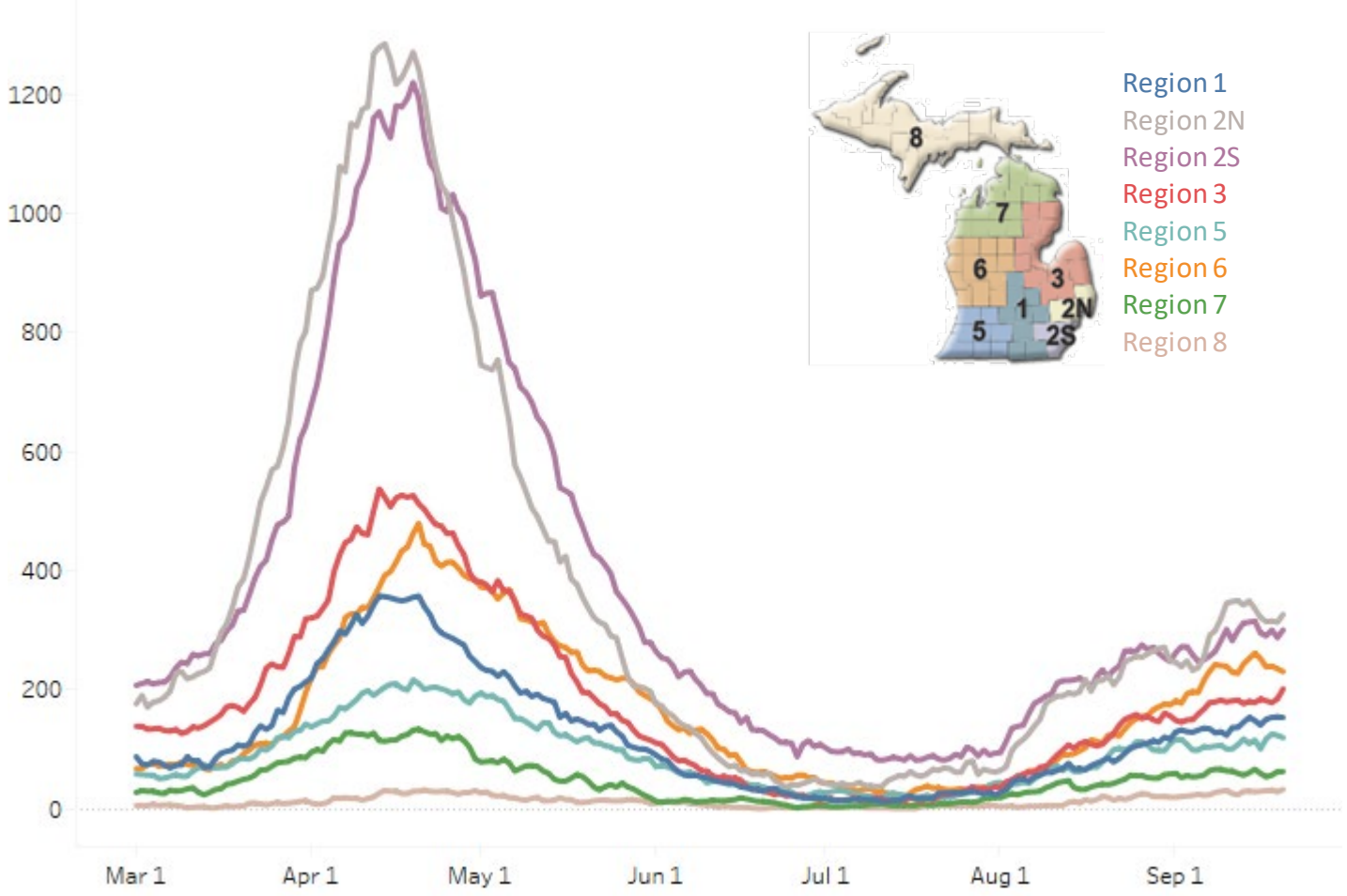
The COVID+ census in hospitals this week is flat from the last week (previous week was up 18%).

Hospitalized COVID Positive Long Term Trend (beginning March 2020)



Statewide Hospitalization Trends: Regional COVID+ Census

Hospitalization Trends 3/1/2021 – 9/20/2021
Confirmed Positive by Region



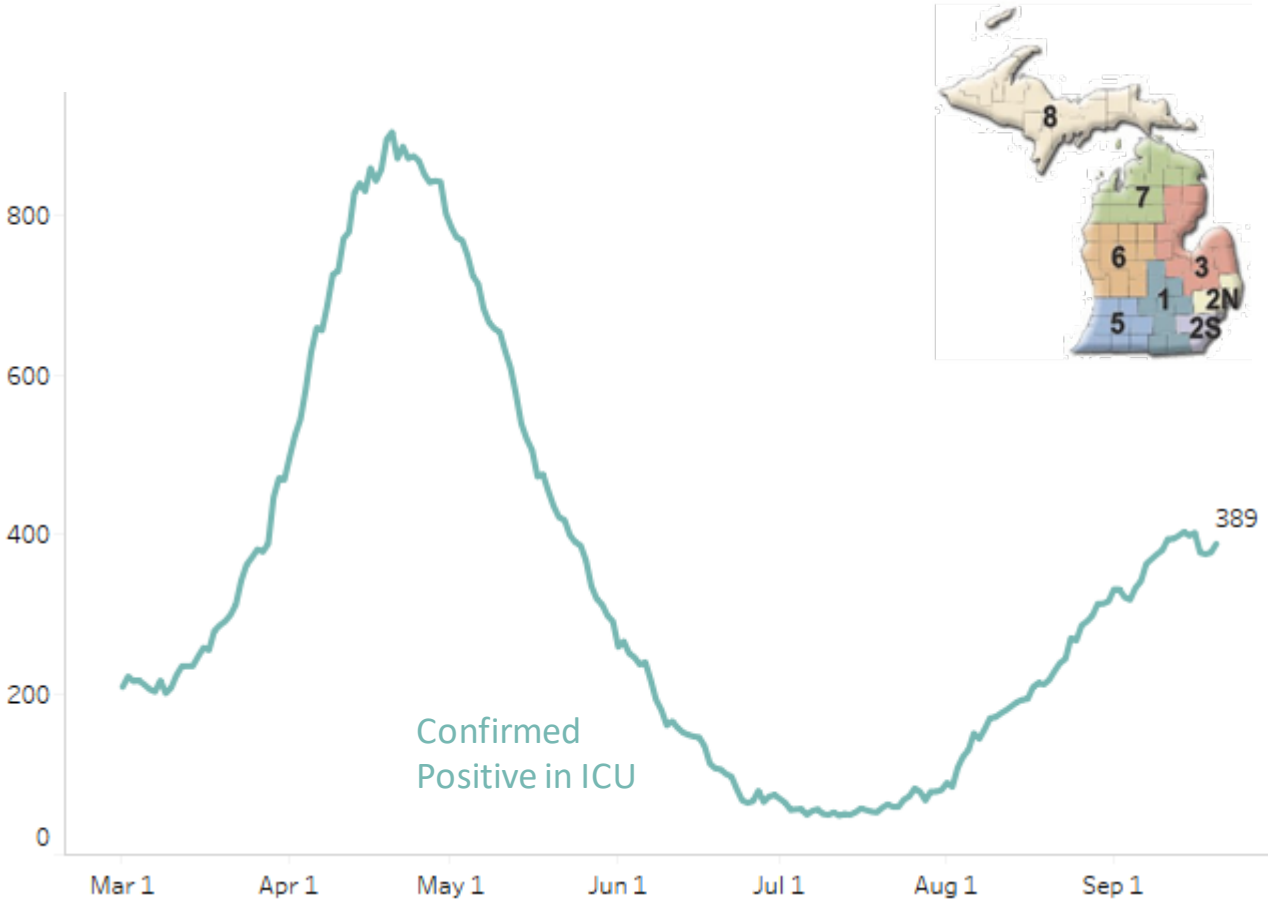
Some regions have increased in hospital census over the past week while other regions have decreased. Region 3, 7 and 8 showed the most growth while Regions 2N/2S and 6 decreased slightly.

Regions 3 and 6 have greater than 150/M population hospitalized with COVID.

Region	COVID+ Hospitalizations (% Δ from last week)	COVID+ Hospitalizations / MM
Region 1	153 (6%)	141/M
Region 2N	326 (-5%)	147/M
Region 2S	300 (-4%)	135/M
Region 3	201 (14%)	177/M
Region 5	119 (2%)	125/M
Region 6	230 (-5%)	157/M
Region 7	62 (11%)	124/M
Region 8	32 (10%)	103/M

Statewide Hospitalization Trends: ICU COVID+ Census

Hospitalization Trends 3/1/2021 – 9/20/2021
Confirmed Positive in ICUs



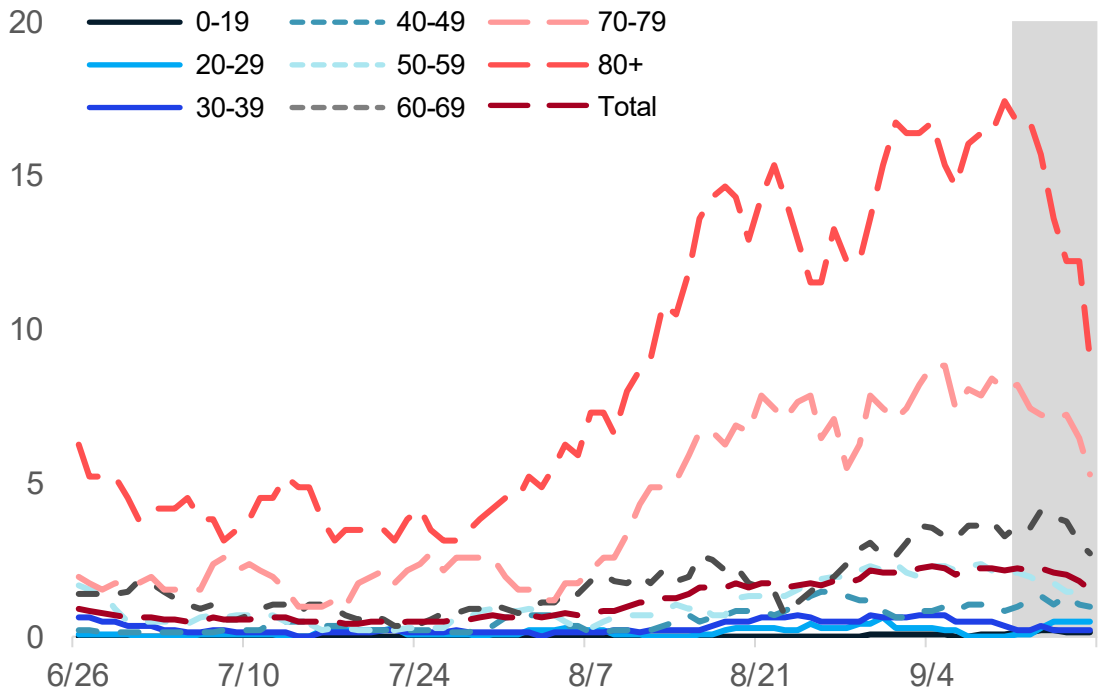
Overall, the census of COVID+ patients in ICUs has decreased by 3% from last week.

Regions 1 and 3 have ICU occupancy over 85% and Region 1 and 6 have >20% of ICU beds occupied with COVID+ patients.

Region	Adult COVID+ in ICU (% Δ from last week)	Adult ICU Occupancy	% of Adult ICU beds COVID+
Region 1	48 (17%)	87%	28%
Region 2N	76 (-10%)	73%	13%
Region 2S	86 (-5%)	83%	12%
Region 3	50 (6%)	87%	15%
Region 5	35 (6%)	70%	19%
Region 6	56 (-15%)	81%	24%
Region 7	26 (4%)	84%	18%
Region 8	12 (0%)	63%	19%

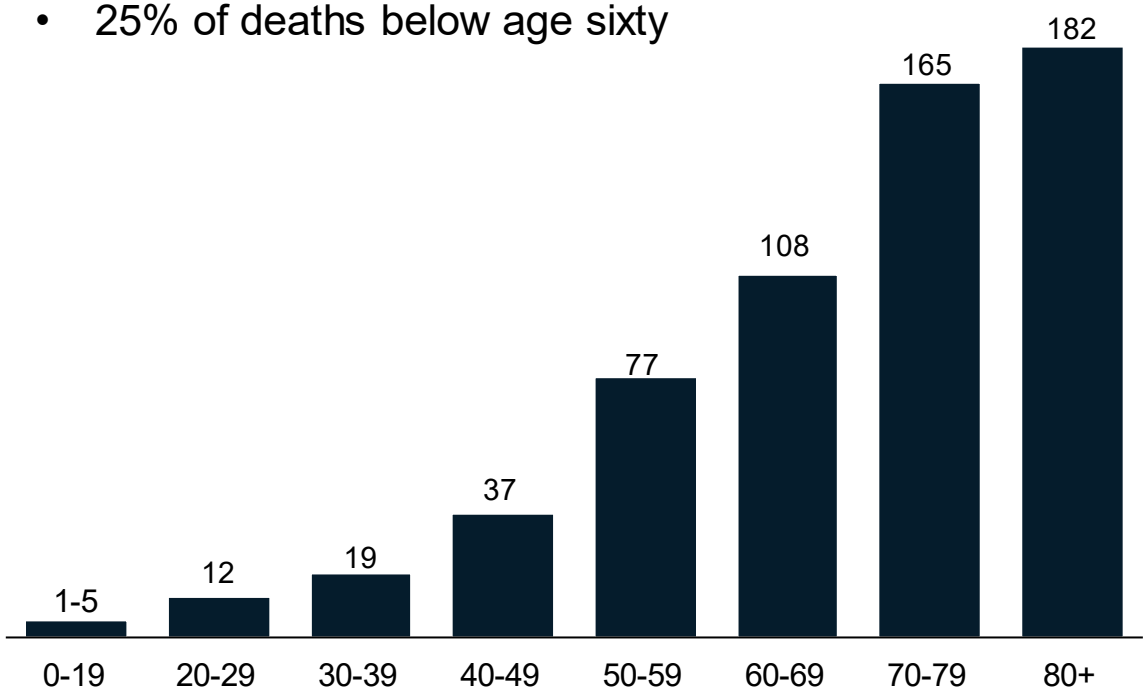
Average and total new deaths, by age group

Daily confirmed and probable deaths per million by age group (7 day rolling average)



Total confirmed and probable deaths by age group (past 30 days, ending 9/13/2021)

- 25% of deaths below age sixty

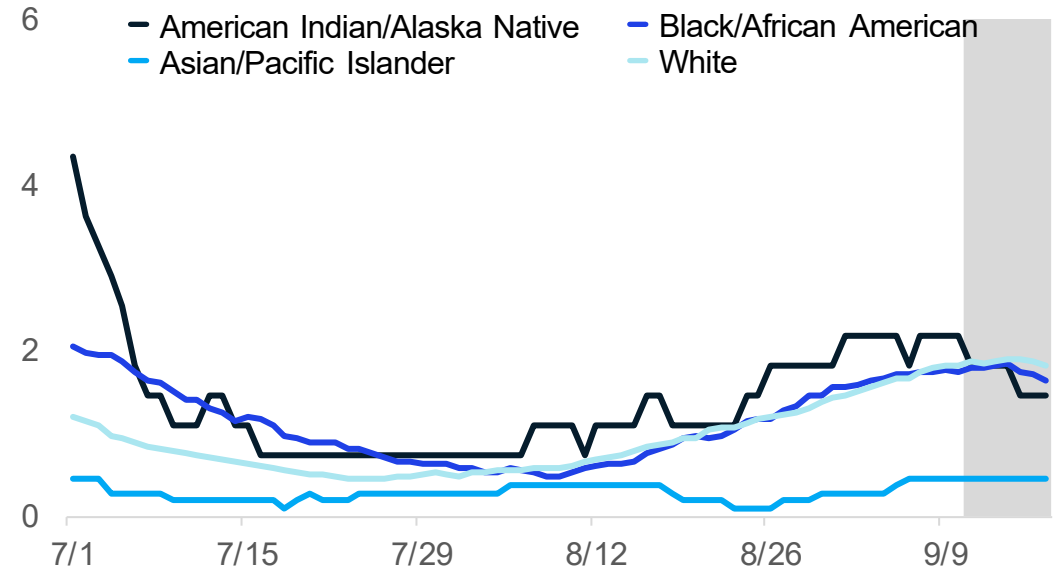


- Overall trends for daily average deaths are increasing since last week
- Through 9/13, the 7-day avg. death rate is more than 7.5 daily deaths per million people for those over the age of 70

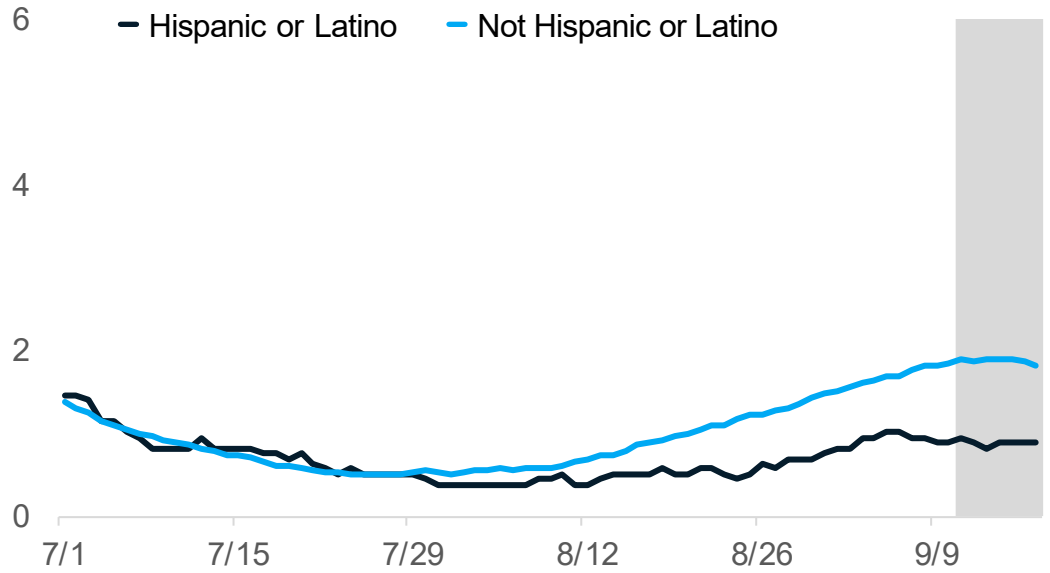
Note: Death information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System (MDSS)

30-day rolling average daily deaths per million people by race and ethnicity

Average daily deaths per million people by race



Average daily deaths per million people by ethnicity



- Additional reviews of vital records death data were performed the weeks of 7/6 and 8/9 to search for race and ethnicity
- This review has resulted in an adjustment of deaths for American Indian and Alaskan Natives from previous weeks
- **Currently, American Indian/Alaskan Natives have the highest death rate**

Note: Death information sourced from MDHHS and reflects date of death of confirmed and probable cases.
Source: MDHHS – Michigan Disease Surveillance System

Key Messages: Public Health Response

Case Investigation and Contact Tracing

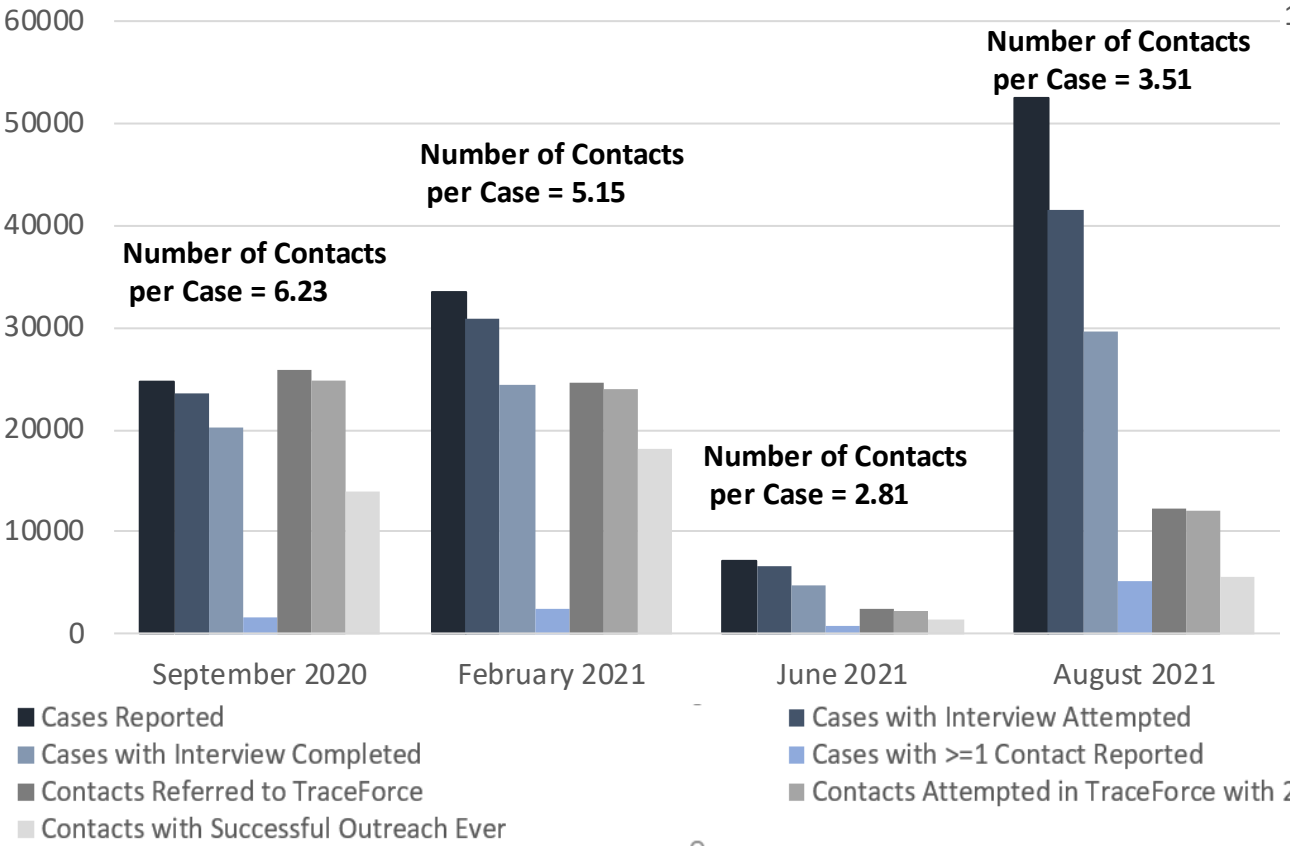
- Significant number of cases and contacts still being reached by public health outreach efforts
- Return on public health strategies is diminishing

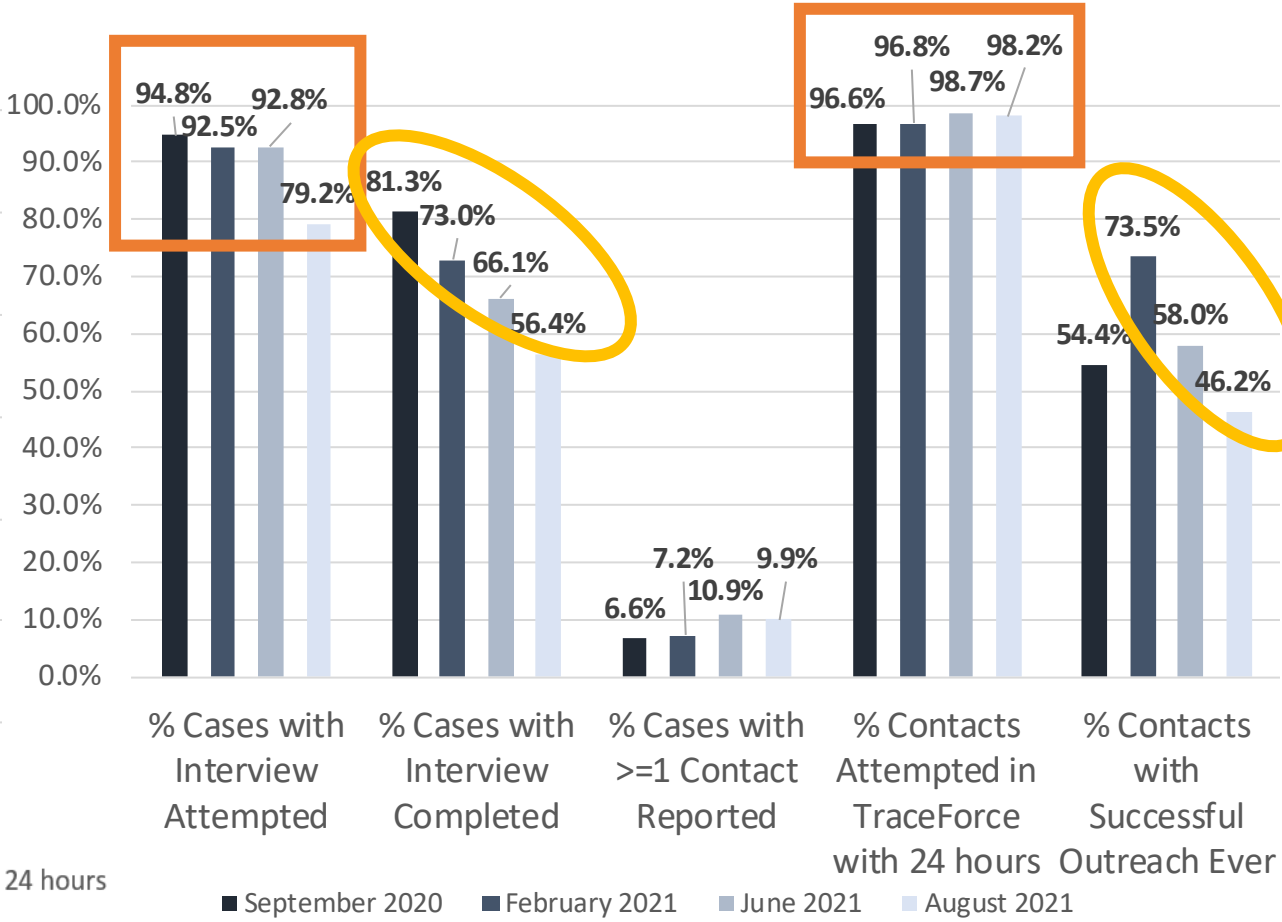
COVID-19 Vaccination

- 5,186 first doses administered each day (7-day rolling average*)
- Most administered frequently by pharmacies, local health departments, and hospitals
- More than 62K third doses administered since third dose recommendation for immunocompromised individuals
- More than 5.1 million people in the state are fully vaccinated

*https://covid.cdc.gov/covid-data-tracker/#vaccination-trends_vacctrends-onedose-daily

Success in Case Investigation and Contact Tracing through the Pandemic





- Significant number of cases and contacts are still being reached from public health outreach efforts, but the number of contacts elicited is declining despite elevated mobility → likelihood that less individuals can respond to potential of exposure or early infection to halt transmission
- Public health follow-up is still occurring but return on public health strategies is diminishing (e.g., decreasing % of case investigation completed and contacts who can be reached)

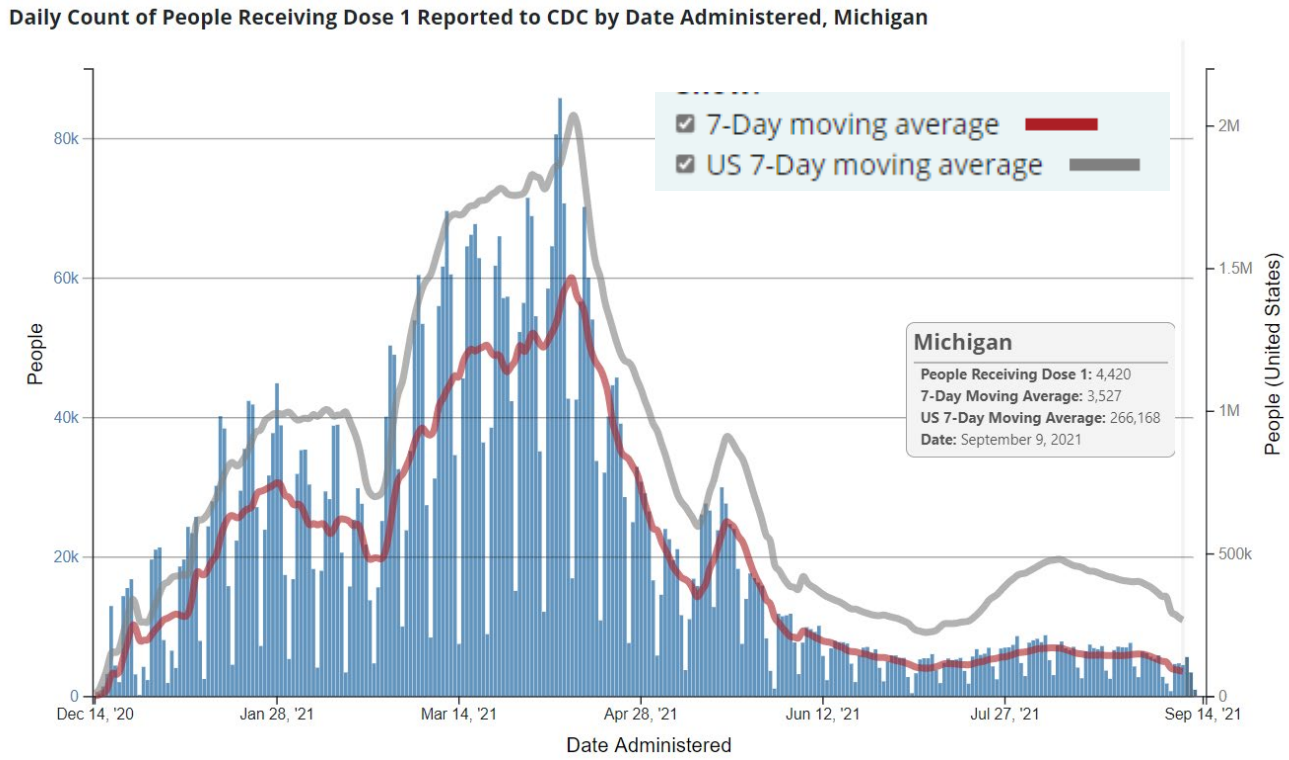
Average daily doses administered declining (data through 9/20/2021)

13,321,110 doses delivered to providers and 10,467,648 doses administered*

MI 7-day rolling average ending September 15th
- 11,046 total doses/day on average †
- 5,186 first doses/day on average †

Total primary series doses (between 9/5-9/11) were most frequently administered¶ by:
Pharmacies (48.9K)
LHD (3.9K) and hospitals (3.6K)
Family practice (2.6K), FQHCs (2.2K), and Pediatric (875)

Third Doses
- 62,487 third doses administered to date



Source: *CDC COVID Data Tracker > Vaccinations in the US, † CDC COVID Data Tracker > Vaccination Trends; ¶ MCIR COVID-19 Vaccine Dashboard

5.2 Million Michiganders fully vaccinated and 51.8% of total population fully vaccinated

5.17 million people in the state are fully vaccinated*

83.5% of people aged 65 and older have completed the series (+0.4%)*

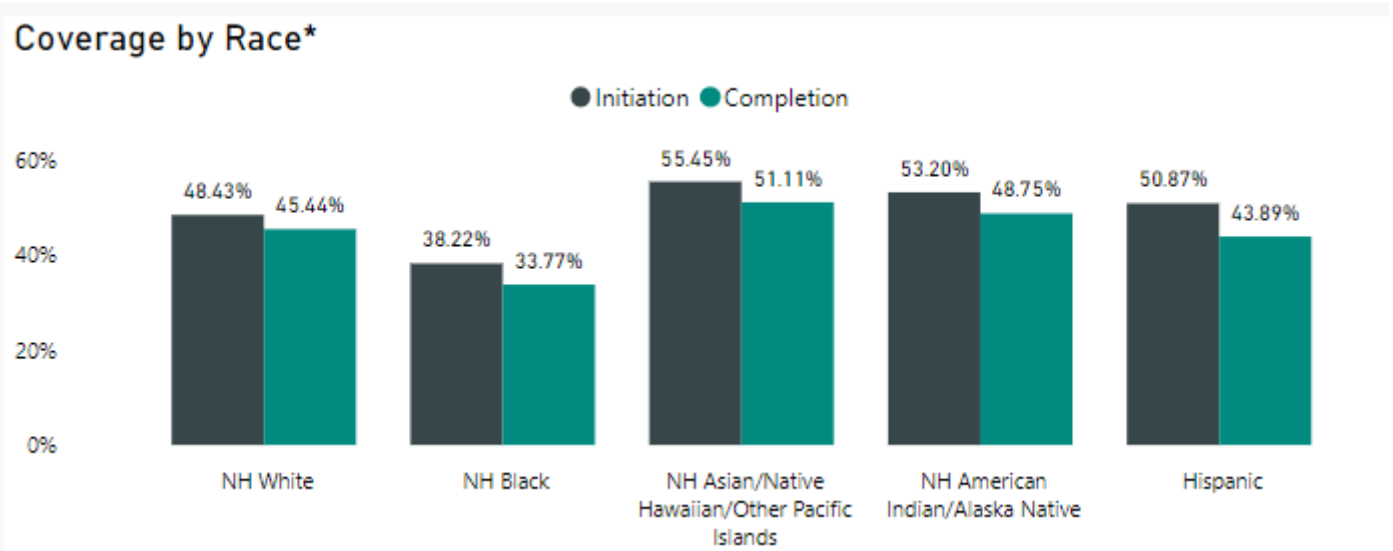
56.5% of total population initiated (+0.4%)*

Race/Ethnicity¶ for those 12 years and older:

- Initiation coverage highest among those of Non-Hispanic (NH) Asian, Native Hawaiian or Pacific Islander Race (55.4%), then NH American Indian (53.2%), NH White (48.4%), NH Black or African American Races (38.2%).
- Initiation is at 50.9% for those of Hispanic ethnicity
- Completion follows the same pattern
- 19.0% data missing or unknown

Vaccination Coverage in Michigan as of 9/20/21

Age Group	% At Least One Dose	% Fully Vaccinated	Number Fully Vaccinated
Total Population	56.5%	**51.8%**	5,170,758
≥ 12 years	65.6%	60.2%	5,170,644
≥ 18 years	67.8%	62.4%	4,890,564
≥ 65 years	87.9%	83.5%	1,473,258



Source: *CDC COVID Data Tracker > Vaccinations in the US, ¶ MCIR COVID-19 Vaccine Dashboard

Potential COVID-19 Vaccination Breakthrough Cases

Michigan part of CDC's nationwide investigation (COVID-19 Breakthrough Case Investigations and Reporting | CDC)

Michigan Data (1/1/21 through 9/14/21):

- **28,974 cases met criteria based on a positive test 14 or more days after being fully vaccinated**
- **Less than 1% of people who were fully vaccinated met this case definition**
  - **Includes 379 deaths (336 in persons ages 65 years or older)**
  - **1,145 cases were hospitalized**

- Vaccine breakthrough cases are expected. COVID-19 vaccines are effective and are a critical tool to bring the pandemic under control; however, no vaccine is 100% effective at preventing illness. Some fully vaccinated people will get sick, and some will even be hospitalized or die from COVID-19. However, there is evidence that vaccination may make illness less severe for those who are vaccinated and still get sick. The risk of infection, hospitalization, and death are all much lower in vaccinated people compared to unvaccinated.
- More than 178 million people in the United States have been fully vaccinated as of September 13, 2021. CDC is monitoring these cases among vaccinated persons and evaluating trends in order to better understand who is at risk for severe COVID-19 following vaccine breakthrough infection. Vaccinated people have also experienced asymptomatic infections.
- Current data suggest that COVID-19 vaccines authorized for use in the United States offer protection against most SARS-CoV-2 variants circulating in the United States.

Update on breakthrough cases

Cumulative COVID-19 Cases by Vaccination Status, Michigan, Jan 15 – Sep 14

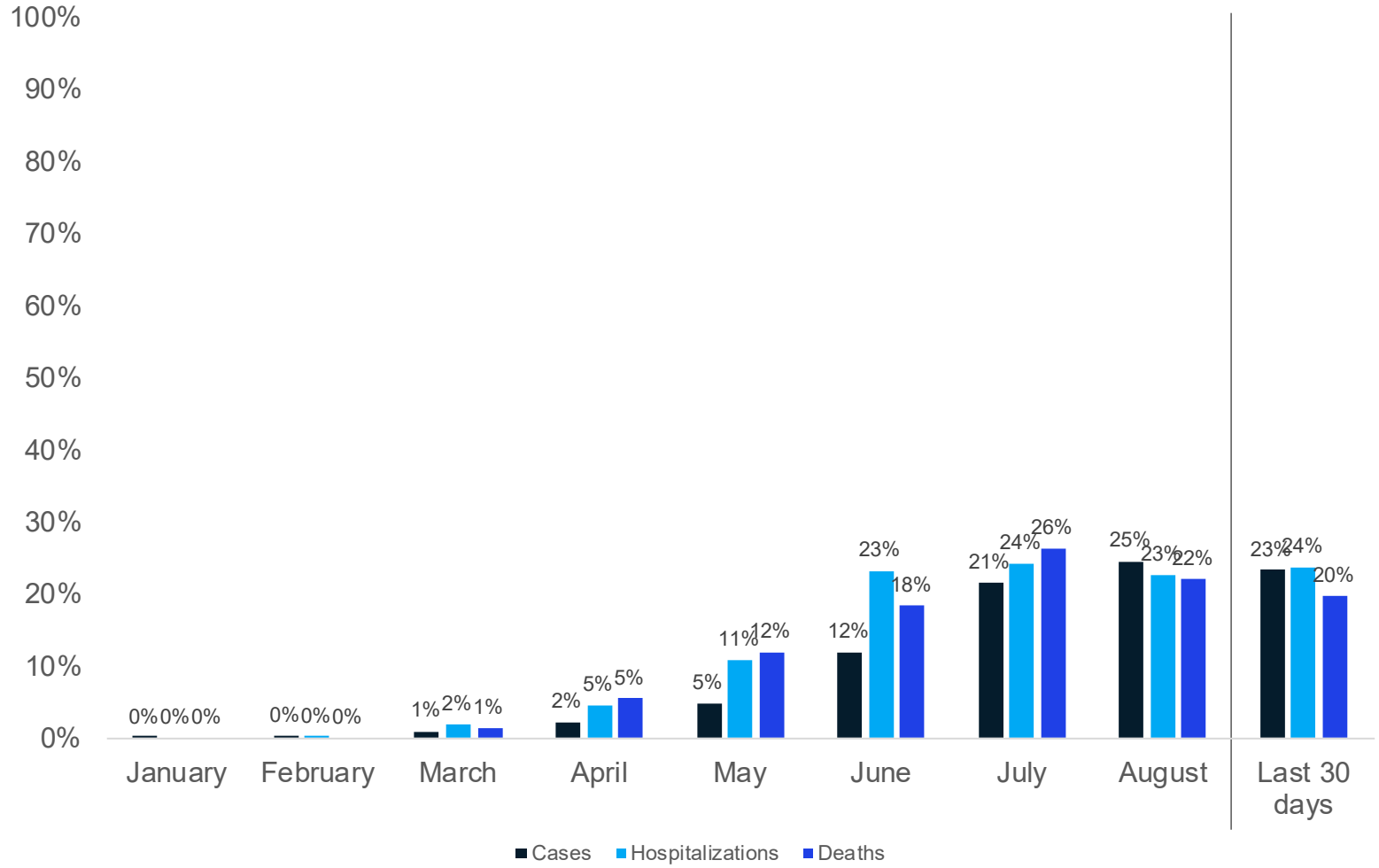
Fully Vaccinated People (4,808,864)		
Cases	**Hospitalization**	**Deaths**
Percent of Cases In People Not Fully Vaccinated (450,900 / 479,874) **94.0%**	Percent of Hospitalizations In People Not Fully Vaccinated (12,641 / 13,786) **91.7%**	Percent of Deaths In People Not Fully Vaccinated (5,148 / 5,527) **93.1%**
450,900 Total Cases Not Fully Vaccinated	**12,641** Total Hospitalized Not Fully Vaccinated	**5,148** Total Deaths Not Fully Vaccinated
Total Breakthrough Cases **28,974**	Total Breakthrough Hospitalizations **1,145**	Total Breakthrough Deaths **379**
0.603% Percent of Fully Vaccinated People who Developed COVID-19 (28,974 / 4,808,864)	**0.024%** Percent of Fully Vaccinated People Who Were Hospitalized for COVID-19 (1,145 / 4,808,864)	**0.008%** Percent of Fully Vaccinated People Who Died of COVID-19 (379 / 4,808,864)
6.0% Percent of Cases Who Were Fully Vaccinated (28,974 / 479,874)	**8.3%** Percent of Hospitalizations Who Were Fully Vaccinated (1,145 / 13,786)	**6.9%** Percent of Deaths Who Were Fully Vaccinated (379 / 5,527)
Total Cases: **479,874**	Total Hospitalizations: **13,786**	Total Deaths: **5,527**

Michigan Disease Surveillance System may underestimate the frequency of COVID-19 hospitalizations:
- Case investigation and follow-up is more difficult for individuals who get vaccinated (e.g., they are too ill to speak to investigators, don't answer their phone, or otherwise).
- These hospitalizations include individuals who are hospitalized for issues other than COVID19 (the same as breakthrough COVID-19).
- Individuals who get hospitalization will lag after infection and may occur after case investigation.

Trends in Breakthrough Cases, Hospitalizations, and Deaths

- 51.4% of the population is fully vaccinated yet only account for ~20-25% of cases, hospitalizations, and deaths
- As the fully vaccinated population has increased, so have the percent of breakthrough incidents; but breakthrough burden remains lower

In the last 30 days (Aug 16 – Sep 14), 13,772 (23%) of 59,222 cases, 297 (24%) of 1,251 hospitalizations, and 50 (20%) of 254 deaths were among fully vaccinated individuals



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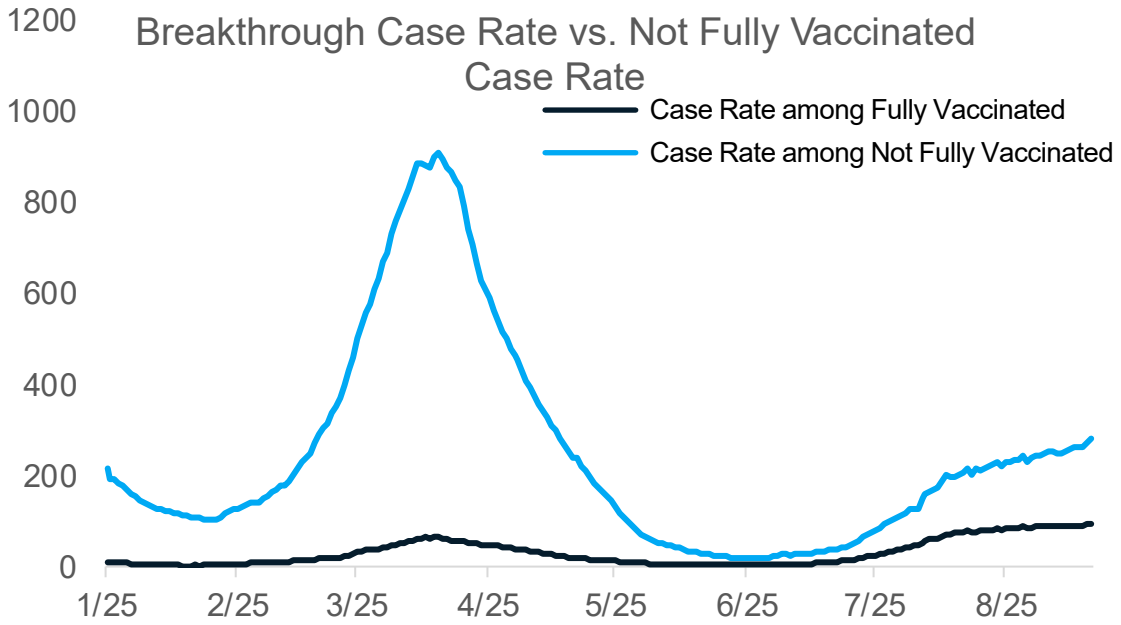
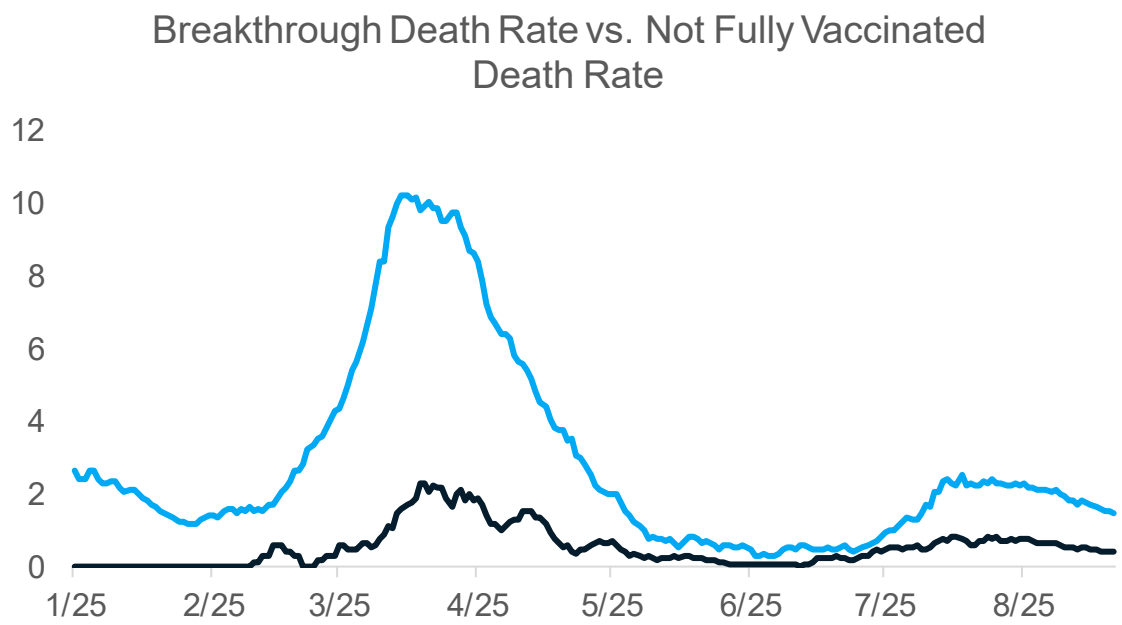
COVID-19 Vaccination Breakthrough Cases and Deaths



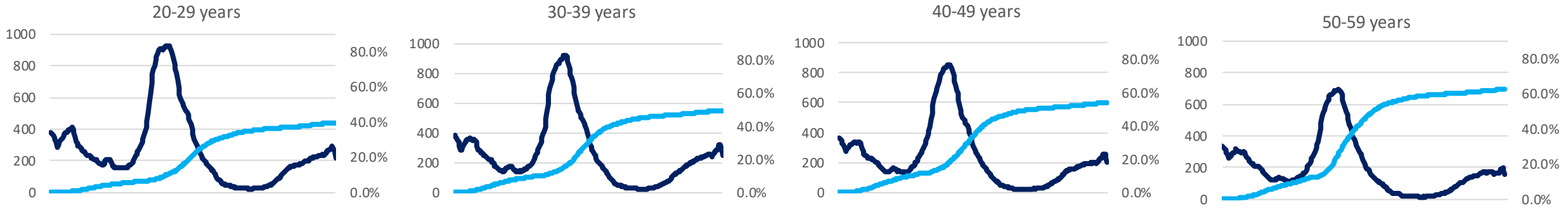


- Trends over time show that both case and death rates among the Fully Vaccinated are lower than the Not Fully vaccinated rates in Michigan
- The *proportion* of breakthrough cases and deaths among all cases and deaths has shown some increases as more people become fully vaccinated
  - However, the risk of infection and death remains significantly lower among the fully vaccinated

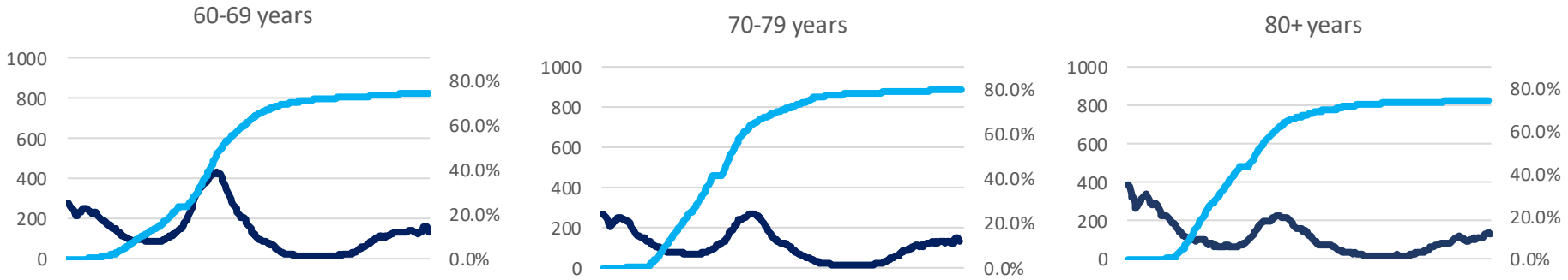
Comparing Vaccine Coverage and Case Rate Trends (Dec 19-Sept 17)

Vaccine coverage (%)
Case rate per million (7-day rolling average)

Vaccine Coverage and Case Rates for Younger Ages



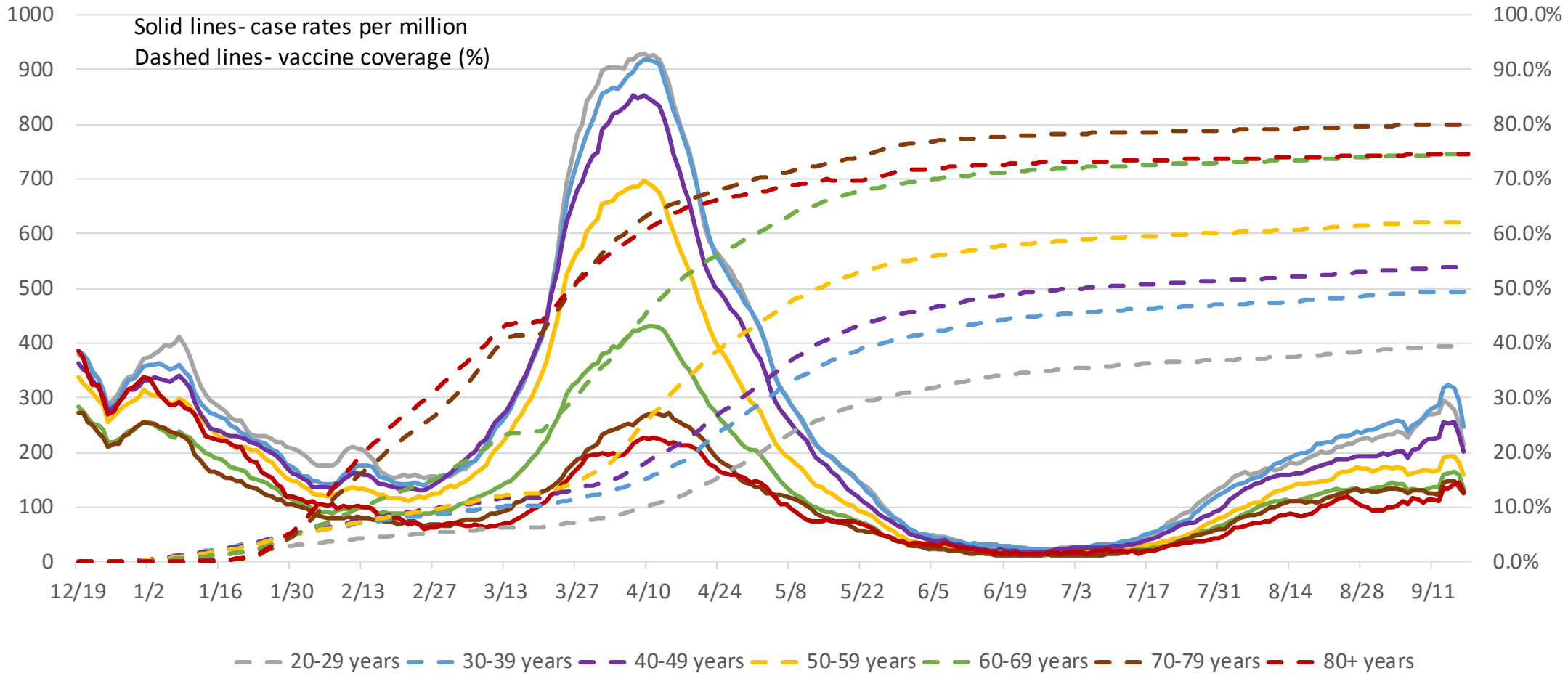
Vaccine Coverage and Case Rates for Older Ages



- Michigan is experiencing another surge due to the Delta (B.1.617.2) variant
- COVID-19 vaccination increases with increasing age
- Risk of COVID-19 illness increases as age increases[1], yet the older age groups in Michigan have had lower case rates during the Delta surge and the previous Alpha (B.1.1.7) surge compared with younger age groups

1. CDC. COVID-19 Risks and Vaccine Information for Older Adults. https://www.cdc.gov/aging/covid19/covid19-older-adults.html

Comparing Vaccine Coverage and Case Rate Trends (Dec 19-Sept 17)



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Science Round Up

Deeper look at trends: What happening in other states and what is projected for Michigan

- Average daily incidence per 100,000 cases in Michigan is currently lower than other Midwestern states experiencing a surge in delta cases
- Ridge regression model projects continued increases for cases and deaths in Michigan although case trends may be slowing
- CDC models project plateau or decline in cases, plateau in hospitalizations, and slower increases for deaths in Michigan

What do we know about COVID in children and schools

- Children can experience severe health outcomes from COVID-19 including MIS-C and Hospitalization
  - In Michigan, hospitalizations for those 0-17 years are not at all-time highs but are increasing since July
  - In Michigan, over 50% of children hospitalized have not reported underlying conditions
- Many of those who experience MIS-C in Michigan are admitted to intensive care, school age, and are Black/African American
  - Higher community transmission in Michigan is followed by higher incidence of MIS-C cases in Michigan
- Local health departments identified 71 schools where classrooms, grades, or entire schools were closed due to COVID-19 exposure or excessive number of individuals who we sick
- Cases in children are increasing and case rates are higher in counties where school districts without masking

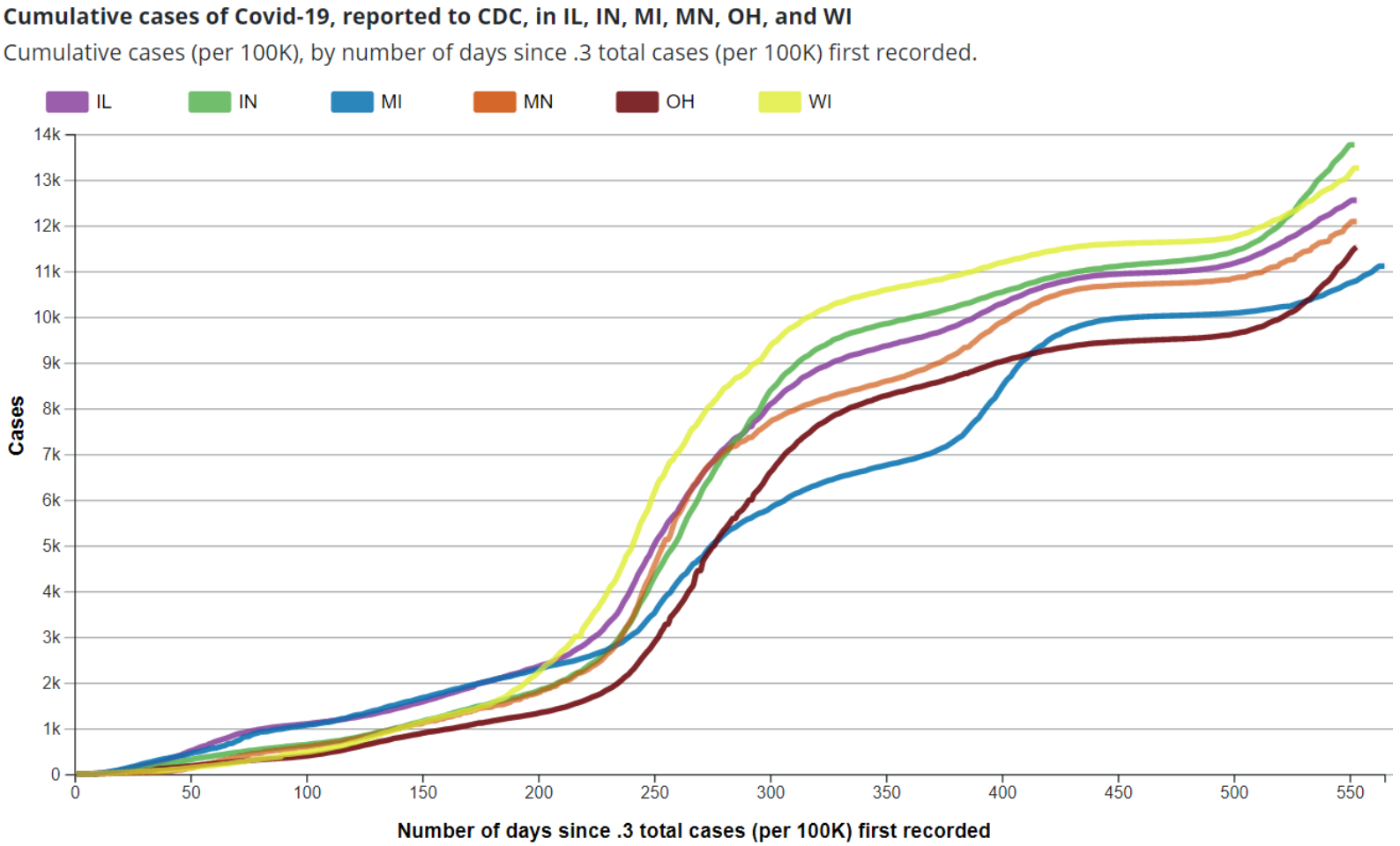
What do we know about COVID-19 vaccine effectiveness

- Vaccination after COVID-19 infection is safe and offers additional immune protection against reinfection
- All FDA-approved or authorized COVID-19 vaccines provide substantial protection against COVID-19 hospitalization

Deeper look at trends: What is happening in other states and COVID forecasts for Michigan

COVID-19 Case Rates: Midwest Comparison (Cumulative Numbers)

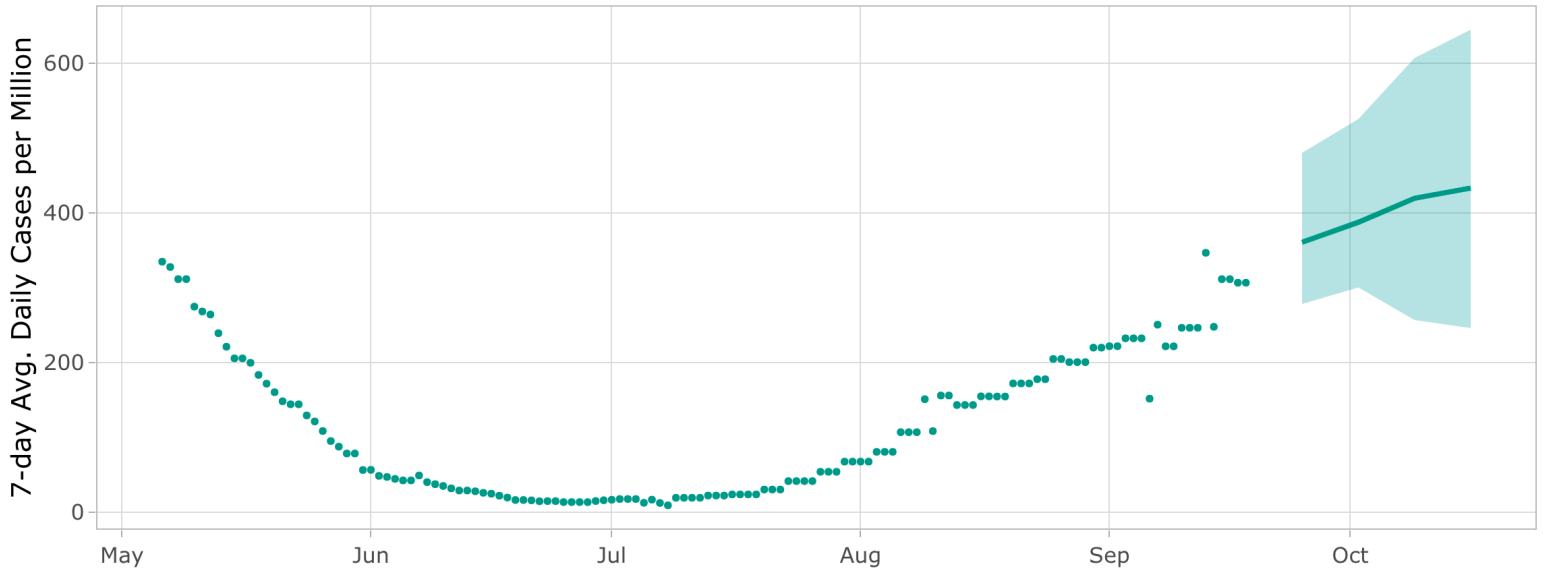
- Average daily incidence per 100,000 cases in Michigan is currently lower than other Midwestern states experiencing a surge in delta cases
- Currently, Michigan has experienced 11.1K/100,000 cumulatively (~11%) while national seroprevalence suggests this is closer to 28%

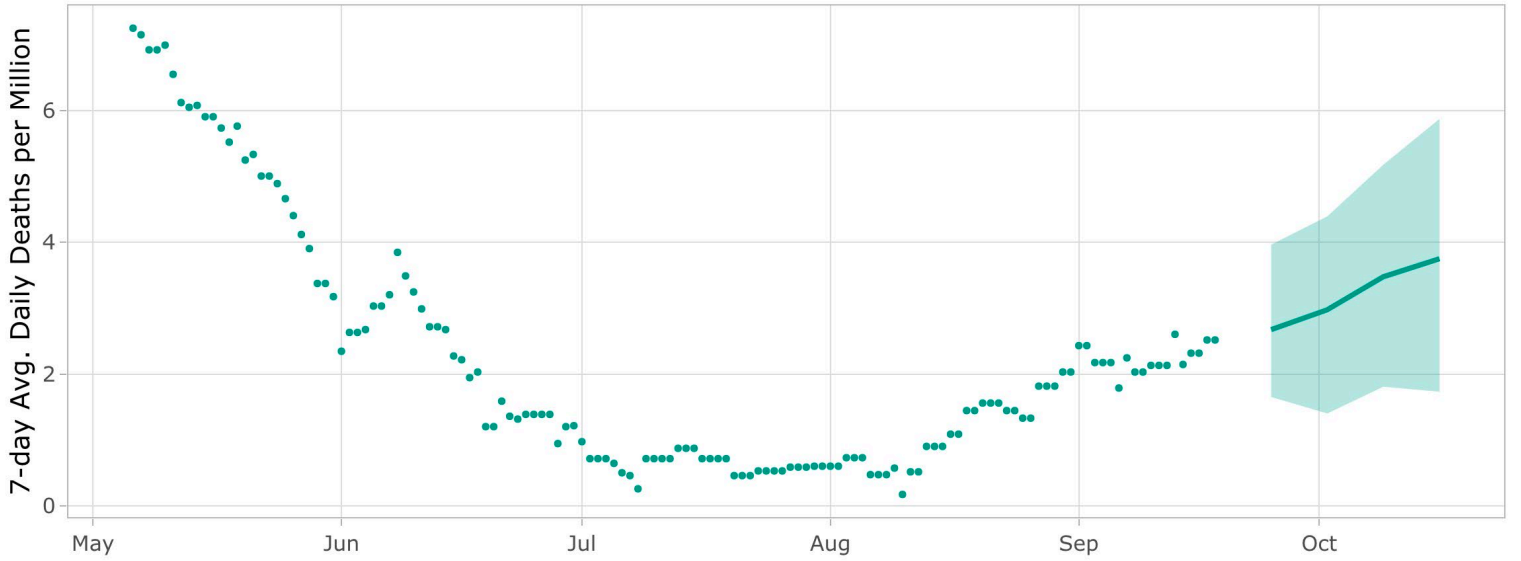


Source: CDC COVID Data Tracker – State Trend Comparison

Ridge regression model projects continued increases for Michigan

- Model projects slowing increase in cases and continued increase in deaths
- Uncertainty ranges for cases and deaths include plateaus or continued increases

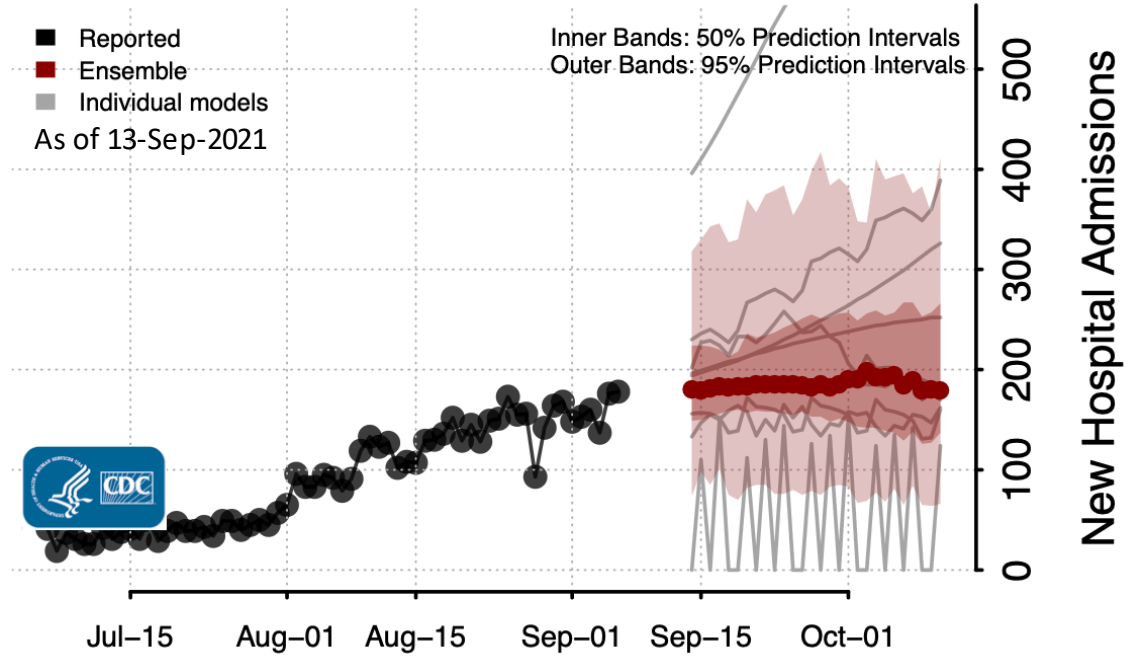


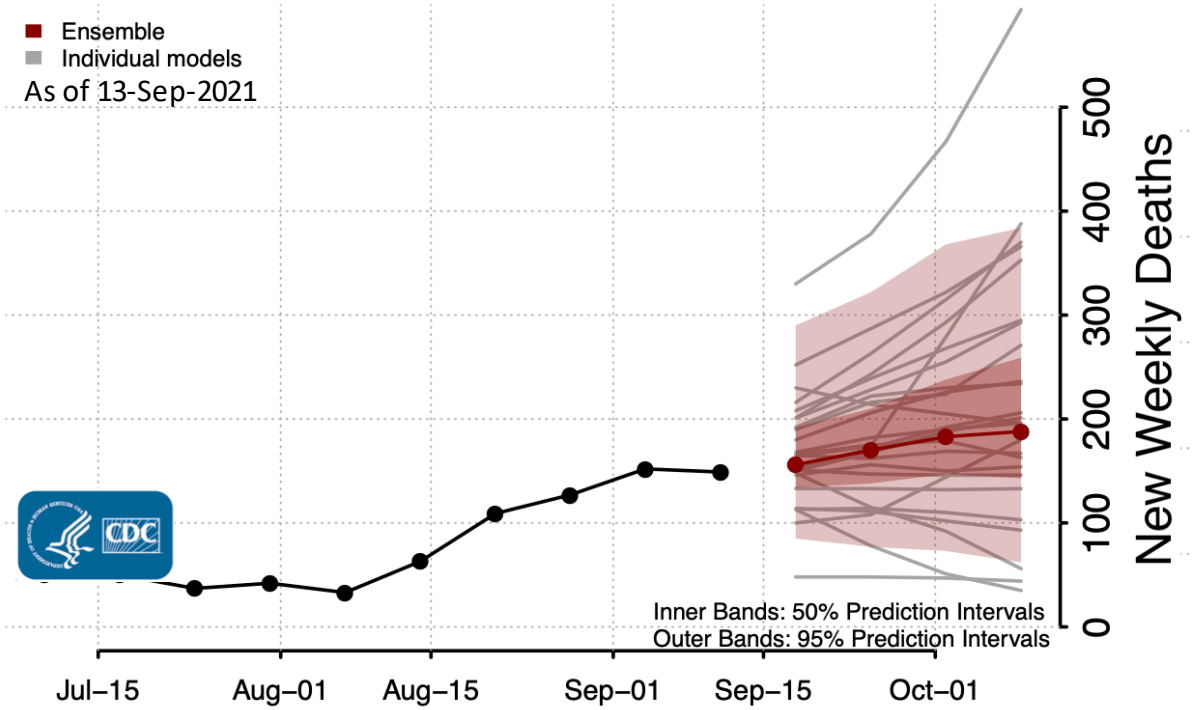


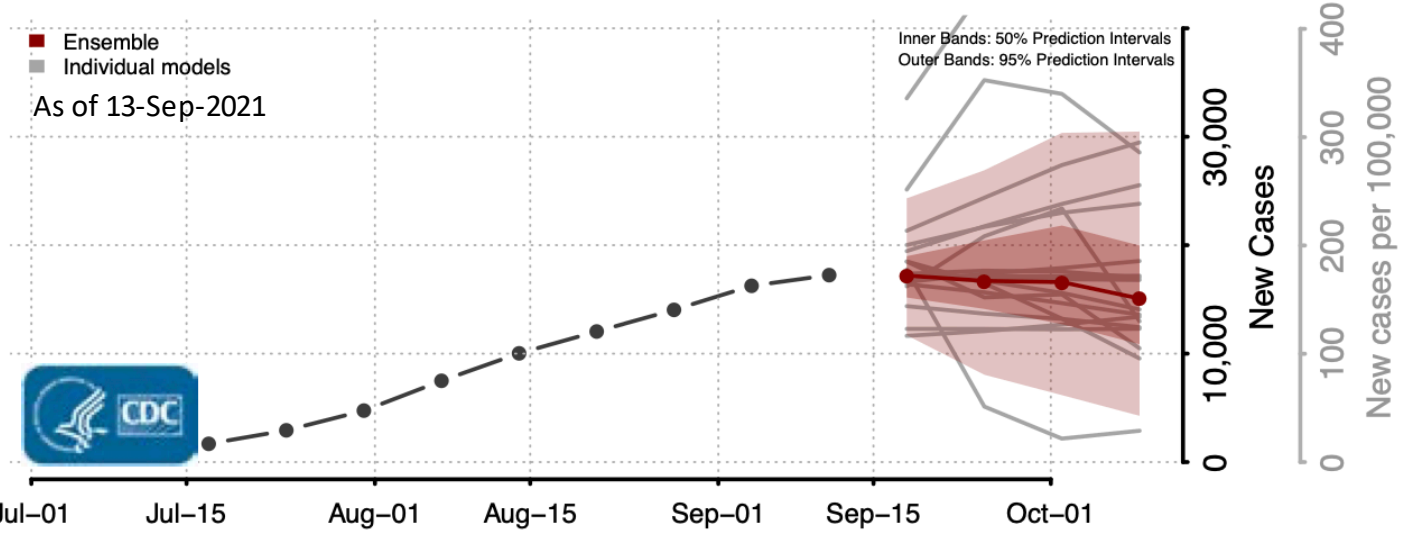
- Line is the ridge regression model projection, and the shaded region represents the 95% confidence region (2.5% and 97.5% quantiles).
- Projections are based on previous data on cases, hospitalizations, and deaths, as well as data on mobility and vaccinations.
- Cases are plotted by report date.
- For full projections and comparison to other Midwest states, see dataepi.org

Sources: Data from MDHHS/JHU, [UM Ridge Regression Model]

Michigan CDC model projections:
- Slowed increases in deaths
- Plateau in hospitalizations
- Plateau or decline in cases







PUBLIC HEALTH

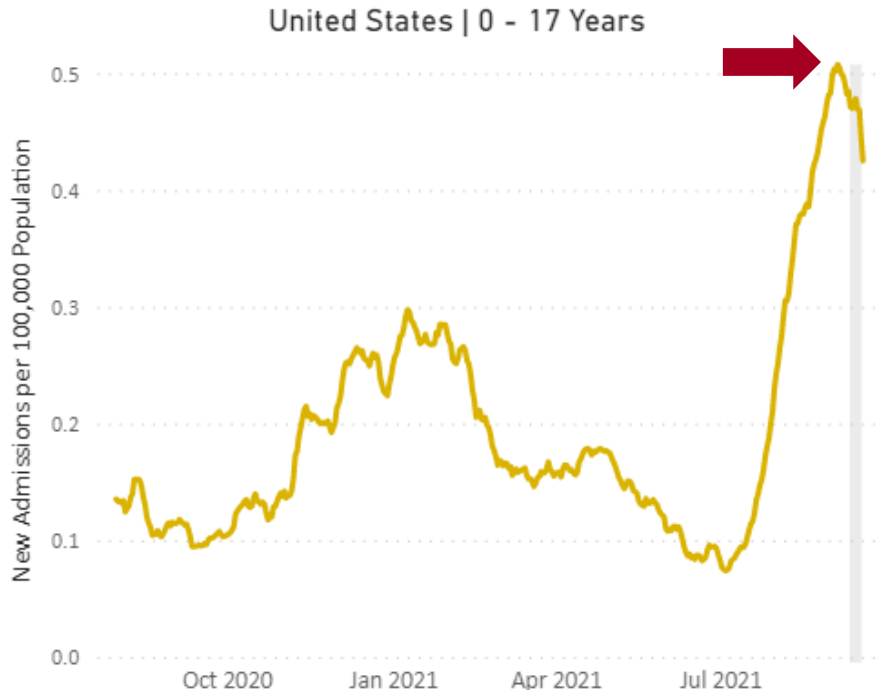
Data Sources: [CDC mathematical model forecasting](), [CovidComplete Data Center]() model forecast evaluations. Individual models shown as grey lines, ensemble shown in red

What do we know about COVID-19 impact on Michigan children and schools

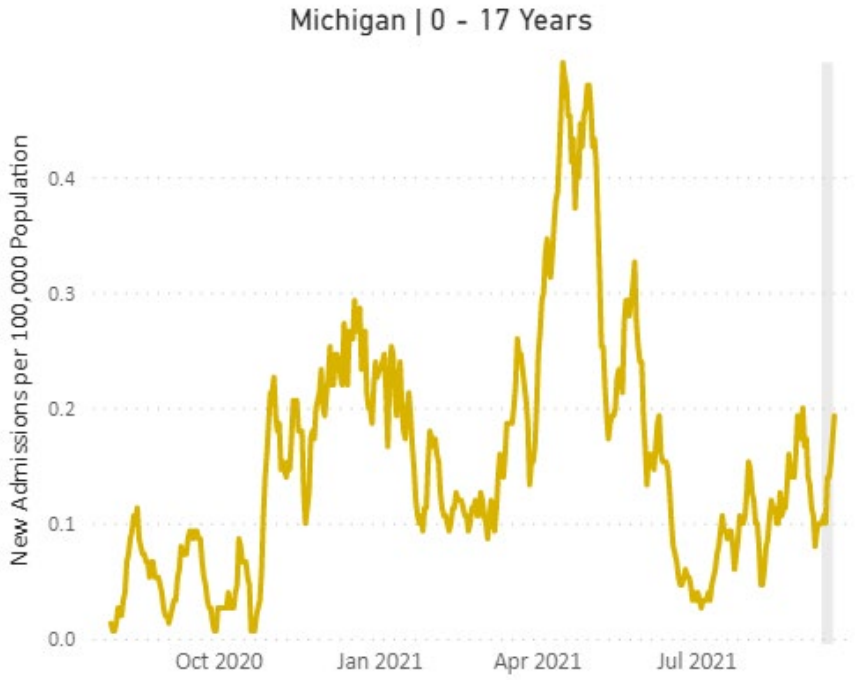
SARS-CoV-2 can Negatively Impact Children Directly and Indirectly

- Children can experience severe health outcomes from COVID-19 including MIS-C and Hospitalization
  - Hospitalizations among children nationwide is higher than it's ever been*
  - In Michigan, hospitalizations for those 0-17 years are not at all-time highs but are increasing since July

United States Hospital Admissions | 0 -17 years



Michigan Hospital Admissions | 0 -17 years



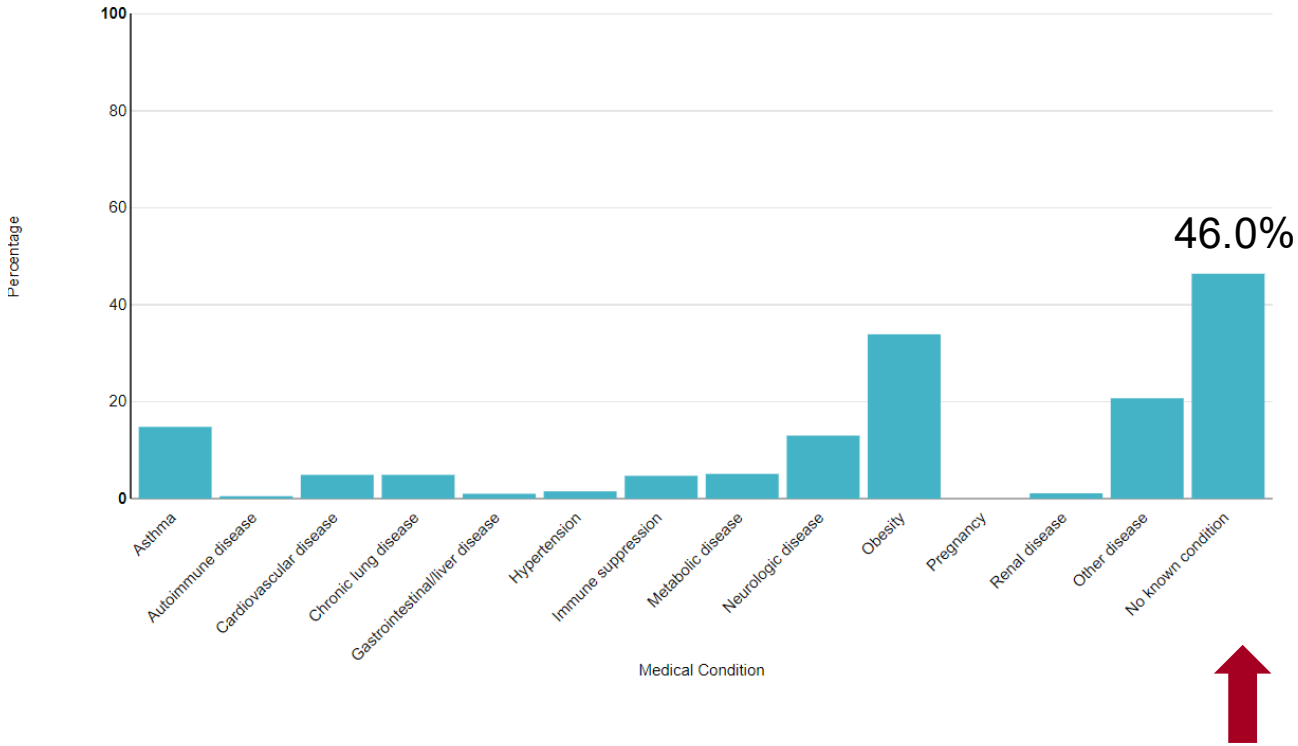
Note: Gray bar indicates lag period where data may be updated

Sources: *CDC COVID Data Tracker > New Hospital Admissions; † COVIDNET

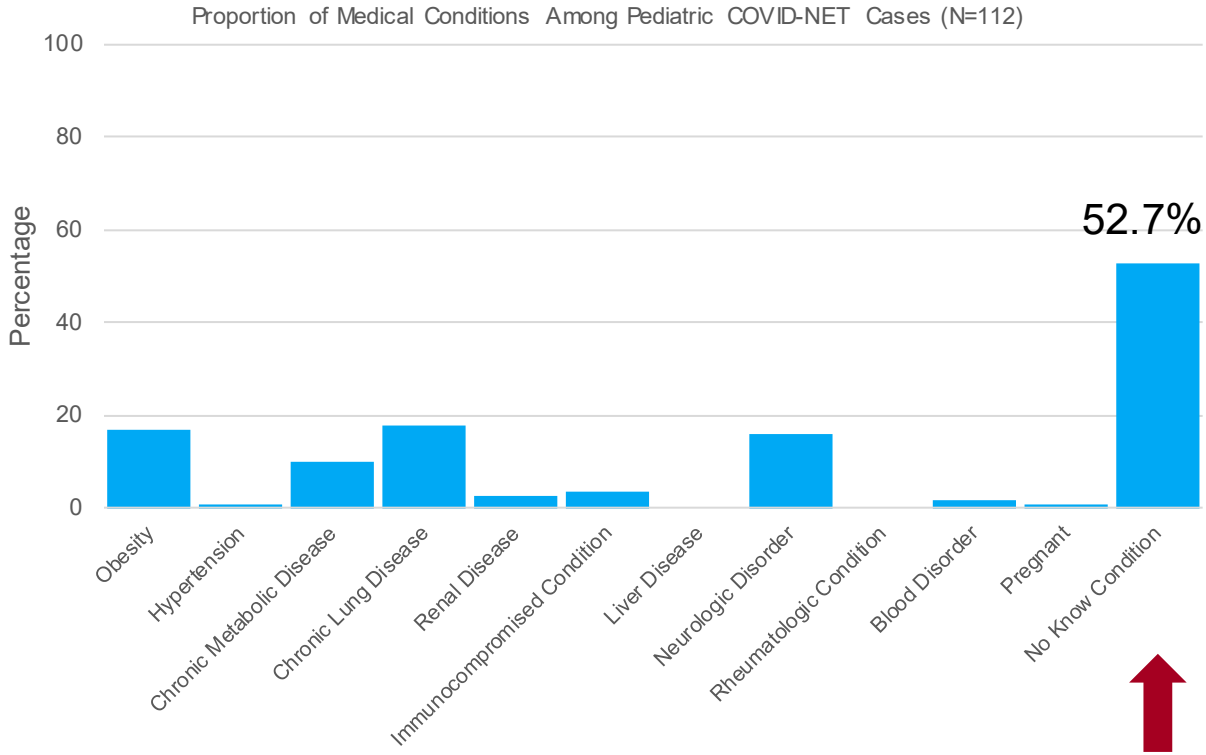
SARS-CoV-2 can Negatively Impact Children Directly and Indirectly

- Children can experience severe health outcomes from COVID-19 including MIS-C and Hospitalization
  - Nationally, nearly half of children hospitalized have no reported underlying conditions†
  - In Michigan, over 50% of children hospitalized have not reported underlying conditions

U.S. Pediatric Hospitalizations | Underlying Medical Conditions



MI Pediatric Hospitalizations | Underlying Medical Conditions



Sources: *CDC COVID Data Tracker > New Hospital Admissions; † COVIDNET

SARS-CoV-2 can Negatively Impact Children Directly and Indirectly

Multisystem Inflammatory Syndrome in Children (MIS-C)

- Higher community transmissions is followed by higher incidence of MIS-C cases
  - Many of those who experience MIS-C in Michigan are admitted to intensive care, school age, and are Black/African American

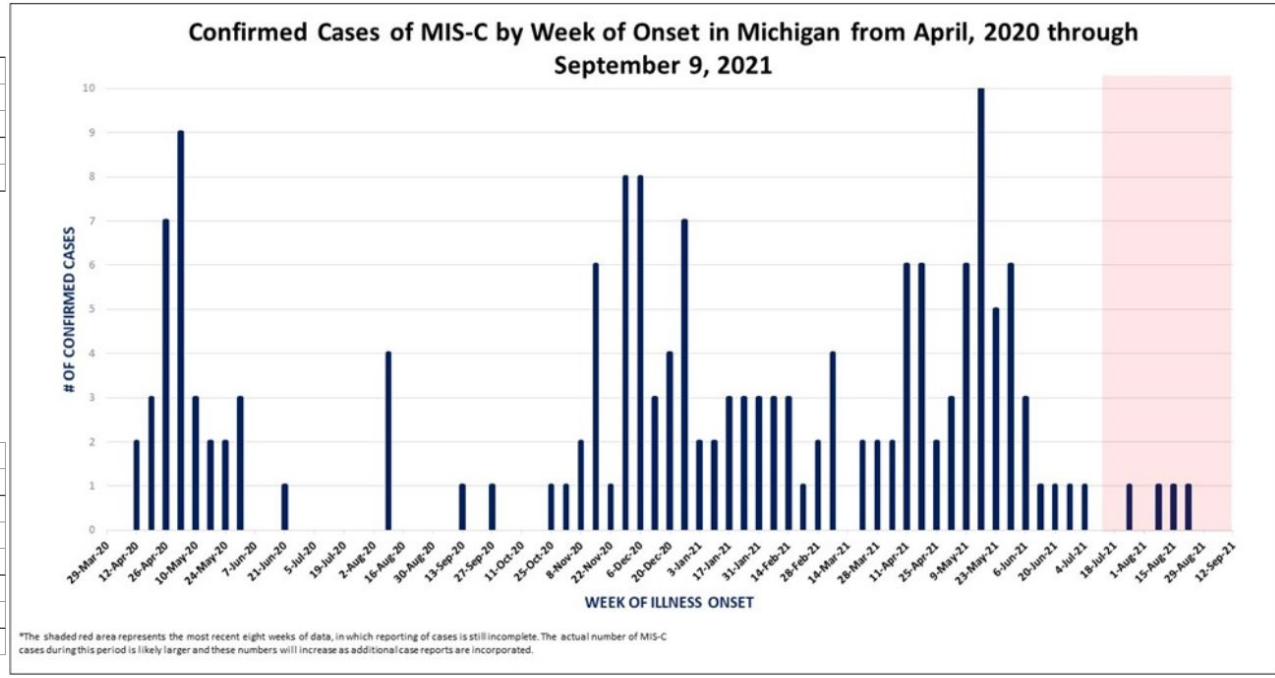
Multisystem Inflammatory Syndrome in Children (MIS-C) Michigan Data Summary 9/9/2021

# Cases Confirmed and Reported to CDC*	163
MIS-C associated Deaths	5 or fewer
Cases admitted to ICU	116 (69.9%)
Onset Date Range	4/14/20 to 8/26/2021
Age Range	0-20 years

*Meets CDC Case definition
https://emergency.cdc.gov/han/2020/han00432.asp

DEMOGRAPHIC INFORMATION (N=166)

Age Group	Count	%	Race	Count	%
0-4 yrs	44	26.5%	Black/African American	72	43.4%
5-10 yrs	68	41.0%	Caucasian	69	41.6%
>10 yrs	54	32.5%	All Others / Unknown	25	15.0%
Gender	**Counts**	**%**	**Ethnicity**	**Count**	**%**
Male	96	57.8%	Not Hispanic or Latino	118	71.1%
Female	70	42.2%	Hispanic or Latino	13	7.8%
Unknown	0	0.0%	Unknown	35	21.1%



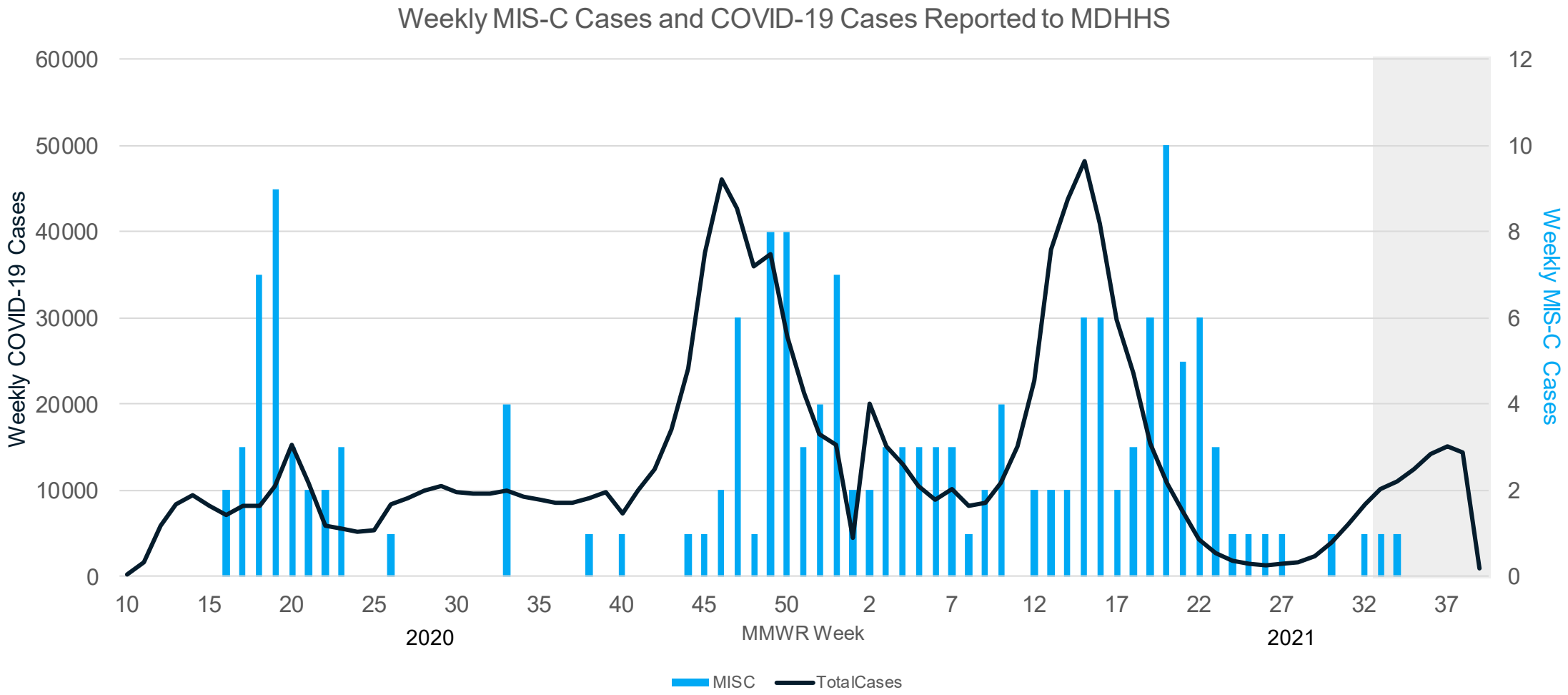
Red shading indicates the expected reporting lag for new cases. Cases with onset dates in this time period may not have been detected or reported yet.

Source: MDHHS and MIS-C Data and Reporting

SARS-CoV-2 can Negatively Impact Children Directly and Indirectly

Multisystem Inflammatory Syndrome in Children (MIS-C)

- Higher community transmissions in Michigan is followed by higher incidence of MIS-C cases in Michigan



Source: MDHHS and MIS-C Data and Reporting

SARS-CoV-2 can Negatively Impact Children Directly and Indirectly: Missed school time

Local health report they are investigating 208 outbreaks in K-12 schools.

But COVID-19 can impact school without transmission within the school building by disrupting the learning environment

As of 9/20, an informal survey of local health departments identified 71 schools where learning time is directly impacted:

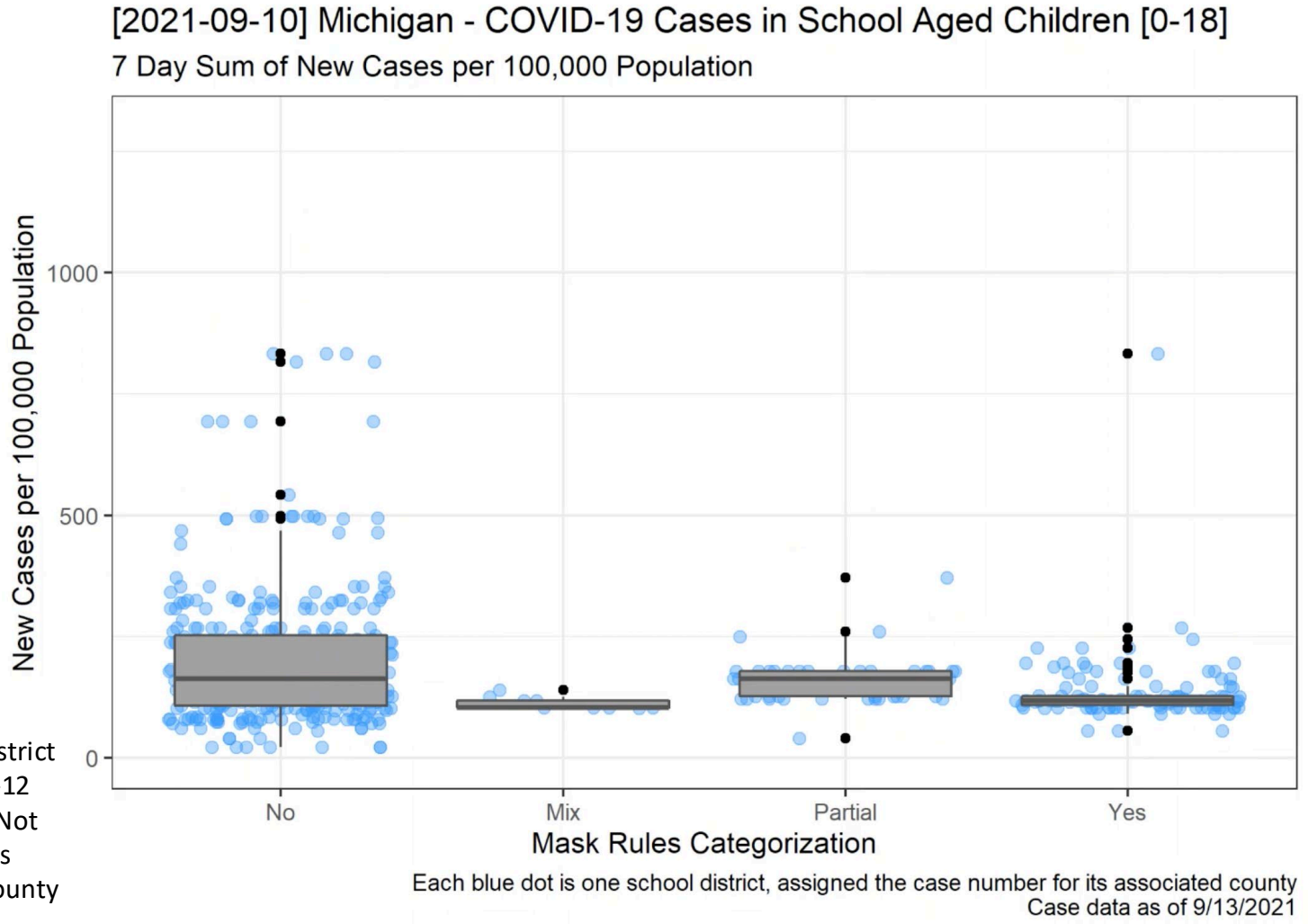
- 12 schools closed entirely
- 8 grades closed entirely
- 38 classrooms closed entirely

17 schools with no operational changes being made because quarantine is optional, but significant number of children needing to quarantine

School reopening: cases in children are increasing and case rates are higher in counties where school districts without masking

Age Group	0-11	12-18	19-30	31-50	51-65	>65
Change in 7-day avg. new cases during school reopening period (Aug 18 – Sep 8)	+57%	+96%	+12%	+5%	-2%	+3%

- Over the course of school reopening period (Aug 18 – Sep 8, from earliest to latest first day of school), the largest % increases have been among those <18 years
- Case rate range is higher in counties where school districts do not have mask rules



Data Sources: MDSS/MDHHS, Executive Office of Governor School District Mask Policy. Mask rules categories: Yes – Mandatory masking in all K-12 schools, Partial – All schools but not all K-12 grades (e.g., K-6), Mix – Not all schools, regardless of K-12 grades, No – No mask policies (includes unknown). Each blue dot is a district, y-axis shows case rate for the county where the district is located (or where most of the district is located).

PUBLIC HEALTH

What do we know about COVID-19 vaccine effectiveness

Why should previously infected people be vaccinated?

Vaccination after COVID-19 infection is safe.

People with milder infections may have weaker protection after infection.[1,2,3]

Tests of immune cells have found that vaccination provides higher[4] antibody levels[5] and additional immune cell protection[6] in people who were previously infected.

CDC analyses[7] have shown that unvaccinated people who already had COVID-19 are more than 2 times as likely than fully vaccinated people to get COVID-19 again.

1. Long Q.X. et al. Nature Medicine. 18 June 2020
2. Thiruvengadam R et al. American Journal of Tropical Medicine and Hygiene. July 2021
3. Nadesalingam A. et al. The Lancet Microbe. 28 June 2021
4. Wellinghausen N. et al. Journal of Clinical Virology. 2020
5. Anichini G, et al. New England Journal of Medicine. 1 July 2021
6. Wang Z. et al. Nature. 14 June 2021
7. Cavanaugh A. M. et al. CDC MMWR. 13 August 2021

Concern if previously infected people skip vaccination: Antibody protection after infection is not universal

CDC Centers for Disease Control and Prevention
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Open Forum Infectious Diseases

MAJOR ARTICLE

EClinicalMedicine
Published by THE LANCET

Sept 2021 - 36% of infected people did not make sufficient levels of protective antibodies (US).[1]

Jan 2021 - 25% of hospitalized COVID-19 patients did not make sufficient levels of protective antibodies (US).[2]

Dec 2020 - ~5% of infected people did not show antibodies across multiple types of tests (Israel).[3]

1. Liu W et al. Emerging Infectious Diseases. September 2021
2. Masia M et al. Open Forum Infectious Diseases. January 2021
3. Oved et al. Lancet EClinicalMedicine. December 2020

New CDC Report: Comparison of vaccines in prevention of hospitalization up to 120 days after vaccination.

- Study of 1,682 hospitalized adults with COVID-19 and 2,007 control patients, Mar 11-Aug 15.
- Included 21 hospitals in 18 states, including Michigan.

TABLE 2. COVID-19 vaccine effectiveness* against COVID-19–associated hospitalization among adults without immunocompromising conditions, by vaccine product — 21 hospitals in 18 U.S. states,† March–August 2021

Vaccine/Period	Vaccinated patients/Total patients (%)		VE against COVID-19 hospitalization (95% CI)
	Case-patients	Control-patients	
Moderna VE after full vaccination			
Full surveillance period§	54/1,517 (3.6)	422/1,321 (31.9)	93 (91–95)
14–120 days after full vaccination	36/1,499 (2.4)	345/1,244 (27.7)	93 (90–95)
>120 days after full vaccination	18/1,481 (1.2)	77/976 (7.9)	92 (87–96)
Pfizer-BioNTech VE after full vaccination			
Full surveillance period	128/1,591 (8.0)	610/1,509 (40.4)	88 (85–91)
14–120 days after full vaccination	65/1,528 (4.3)	495/1,394 (35.5)	91 (88–93)
>120 days after full vaccination	63/1,526 (4.1)	115/1,014 (11.3)	77 (67–84)
Janssen (Johnson & Johnson) VE after full vaccination			
Full surveillance period	37/1,500 (2.5)	76/975 (7.8)	71 (56–81)
>28 days after full vaccination	33/1,496 (2.2)	59/958 (6.2)	68 (49–80)

Effectiveness lower in people vaccinated >120 days earlier for Pfizer, not Moderna

Self W.H. et al. CDC MMWR. September 1, 2021